The International Journal of
Orthodontia, Oral Surgery and Radiography
(All rights strictly reserved)

VOL. VIII ST. LOUIS, AUGUST, 1922 No. 8

ORIGINAL ARTICLES

PRESIDENT'S ADDRESS. DELIVERED BEFORE THE ALUMNI SOCIETY OF THE DEWEY SCHOOL OF ORTHODONTIA, APRIL 27-28, 1922

BY JOS. D. EBY, D.D.S., NEW YORK, N. Y.

AS evidence of the highly appreciated honor and the confidence which you, my fellow alumni, have reposed in me, it is my privilege as President of the Alumni Society of the Dewey School of Orthodontia to address you this morning.

During the past year the moments spent in thinking over what I should say to you have been filled with a degree of personal pleasure and the presidential addresses which I have delivered unto myself have been far deeper than any which I can possibly give to you, as there has gone through my mind practically every detail concerning you as individuals in the pursuit of your duties from the plaster impressions up to your present progress.

This is not the time to review those delightful memories but rather does it fit the occasion to deal with the general factors in the development of this Society constituting the agencies which make for the motive power and determine the direction of our progress, and which are to guide us along the pathways of the future. In the desire to realize clearly those intangible elements, the subject matter of my thoughts has crystallized around the past, present and future with their many interesting phases and interrelated conditions, which should be kept carefully before us with a view of anticipating and regulating the policies of the future instead of running blindly along unknown avenues which would divert us from those paths of progress which mark proper advance.

Let us make a review of the past to enable us to determine to a cer-

tain extent our present status and to govern ourselves accordingly in the future.

The Alumni Society, like the school, has been the result of evolutionary growth, brought about by conditions over which no one had very much control. In fact the development of orthodontia as a science has been the result of demands in the dental profession that *science* be followed for the correction of malocclusion of the teeth.

As interest increased in this line of work, it naturally followed that men would seek certain sources whereby they could obtain knowledge, and, as interest grew more keen, that schools should spring into existence, just as they have in other branches of science.

The Alumni Society, of course, was the natural outgrowth of the Dewey School, which itself to a certain extent was the result of these before-mentioned conditions. The first class came into existence in 1911 by the solicitation of men who desired to obtain instruction under Dr. Dewey. By a peculiar coincidence, the entire class came from Kansas and, while the numbers were small, nevertheless that first class, in which Dr. Esterly took a leading part, may be considered largely responsible for the organization of the Dewey School as we know it today.

Immediately after the close of that course, which was more of a special course of instruction, Dr. Dewey began to receive communications from men all over the United States asking for instruction in orthodontia. As a result of their requests, the Kansas City School of Orthodontia was organized to provide a place where men could obtain instruction in this science.

The next class was in 1912 and in numbers it was increased by exactly 300 per cent over the membership of the preceding year.

Sessions have been given ever since that time. The class of 1913 was distinguished by having as one of its members the first man to attend with an M.D. degree only, a rhinologist by profession who took a complete postgraduate course in orthodontia. I refer to Dr. Reginald R. Walker of Washington, D. C., who is now a member of the Faculty of the Dewey School giving lectures on rhinology as related to orthodontia and such other phases of rhinology as pertain to our science.

The class of 1914 was the largest class of any up to that time and it was the members of this class who, among themselves and by correspondence with previous classes, persuaded Dr. Dewey to change the name of the Kansas City School of Orthodontia to the Dewey School of Orthodontia, as it has since been known to the profession. The class of 1914 was unique also because of the wide range of territory from whence its students came, enrolling men from Canada to Texas and from the Atlantic Seaboard to the Pacific Coast. This class also started the movement to organize the Alumni Society as it exists at the present time.

The first President of the Alumni Society was Dr. F. B. Wilcox of Topeka, Kansas, a member of the 1914 class, and the first Secretary was Dr. A. C. Gifford. Prior to 1914, the Alumni Society had existed only as a social institu-

tion marked at the end of each session by a banquet attended by members of the class, the Faculty, and such graduates as desired to attend.

With the organization of the Alumni Society in 1914, it was the purpose of the founders not only to make the Alumni Society a social organization but also to extend its usefulness for a scientific purpose, namely, the advancement of orthodontia, and also for the stimulation of interest among the graduates of the Dewey School. The first meeting of a scientific nature was held in Kansas City, Mo., in February, 1915, and was attended by your President. A paper was delivered at that meeting by Dr. Lischer, and Dr. Federspiel gave a series of lectures on oral surgery as related to orthodontia.

The next meeting was held in Kansas City, in 1916, and it was then decided that, for the convenience of members who were located at a considerable distance from Kansas City, the meetings of the Alumni Society would be separate and independent from the session of the School and would be held in such cities as the membership should designate.

Therefore, the 1917 meeting was held in Chicago, March 13-16. It was the first attempt the Society had ever made to hold a four-day meeting and it was highly successful. At that time it was planned to hold a similar meeting the following year but the time and place were not decided upon. In September, 1917, the American Society of Orthodontists met at Excelsior Springs, Missouri. During that week the Executive Committee and the officers of the Dewey Alumni Society had a special meeting and decided it would be to the interest of all the members of the Alumni Society to hold the meeting just *previous* to that of the American Society of Orthodontists.

Dr. Dewey objected to this, however, because he realized the motives would be misinterpreted (and events proved that they were) but the members of the Alumni Society decided that, as they composed the Society and their motives were beyond criticism, it was best to hold the meeting of the Alumni Society prior to that of the American Society of Orthodontists, and this decision was carried out until this year.

This year it was decided that it would be more desirable for the Alumni Society to meet *after* the meeting of the American Society of Orthodontists.

This, in brief, is an outline of the history of the development of the Alumni Society of the Dewey School. The growth of the Society in the last few years is sufficiently familiar to all of you as not to warrant discussion here.

It has always been the desire of the officers of this organization to develop a scientific program which would be of value, first, to the members of the Alumni Society and, secondly, of interest to the men outside the Society. Owing to the success which the officers have had in the past in securing essayists, a number of men in the orthodontic profession have for many years availed themselves of the privilege of attending these meetings and we would say that they have always been, and always will be welcome. It is to the credit of the Alumni Society that men prominent in the orthodontic field have been willing to read papers before us.

At a meeting held in Chicago, in 1917, Dr. Mershon gave a complete exposition of his band technic and lingual arch, and ever since his methods

have been largely used by the orthodontic profession. Dr. Charles R. Baker of Evanston also read a paper at that meeting and I think Dr. Baker has attended every meeting of the Alumni Society since that time and he will always be welcome.

In his President's address before the Society in 1917, Dr. Purcell suggested that the organization be changed and that instead of being an Alumni Society it be made a scientific society of orthodontists, allowing anyone who so desired to become a member. Dr. Purcell had the courage of his convictions but, nevertheless, most of the members believed he was mistaken. They realized that those intimate elements, born in the minds and hearts of men who have struggled through an organized institution together, producing necessarily that close feeling and common possession of thoughts which are so allied to kinship, are injected into an alumni body as the outgrowth of a parent organization and that to change this would be to destroy those deeper purposes specific within the organization, as well as the fundamentals upon which it was founded and the purposes for which it was intended. Dr. Purcell's plan was, therefore, abandoned. It was felt, too, that men who were not graduates of the Dewey School and could not obtain membership would, nevertheless, always be shown every courtesy. The result of following that plan has proved it to be wise because it has enabled the Society to be a more closely united body with a more decided and definite purpose than a general scientific orthodontic society could be.

Just here we would call your attention to those articles in our Constitution which provide for the admission of Honorary Members. Last year this Society exercised this provision by honoring with this high rank Doctors Martin Dewey, E. A. Bogue and V. H. Jackson, men whose faithfulness and contributions to science will serve as monuments in the background of progress. It is noteworthy that the last paper written by Dr. Bogue before his death was read before this Society.

Owing to the large success which the officers of the Society have had in arranging programs for previous meetings, it is gradually becoming more difficult to provide a program for each succeeding meeting and still keep up the standard that has been set by the previous programs. Just here I wish to pay a tribute to Dr. W. E. Flesher of Oklahoma City and give him special credit for his interest and energy in developing the program for this meeting and also to thank all the officers of the Society for the work which they have done this year in arranging a program which I feel is second to none that has ever been presented.

A new departure has been arranged in the manner of reporting cases which our Secretary, Dr. Burke, in his inimitable manner, has called the "Family Fair," the idea of which is to promote that degree of freedom and close relation which should characterize an alumni society and procure more intimate expressions than have been given in the past.

Regarding our present status, we may now look upon our organization in a way entirely different from that of the formative years of the past because of the fact that the Dewey School of Orthodontia, which we all hold

dear unto our hearts as the parent body of which we are the offspring, is a live, permanently established and a virile organization which, under the leadership and constant care of Dr. Dewey, we have every reason to believe is going to continue to improve and to undergo that degree of expansion which will enable it to meet the demands and increasing requirements of modern progress in orthodontic education. With the addition of each graduating class into our fold, we confidently expect to grow into greater proportions and never become a senile organization. Because of this fact we should each feel, as individuals, a great degree of personal interest and pride in the welfare of our Alumni Society, and the officers particularly should be alert to provide for the increasing demands which the progress of the time and the changing conditions will require.

Just here I wish to evoke your most jealous care in selecting your officers in the future with regard to men of energy and in whose hearts the interests of our Society are deeply planted.

It comes to my observation that our Society has outgrown the present Constitution and By-laws and, for this reason, I wish to suggest that the proper procedure for their revision be effected at this meeting.

I believe it would be unwise for our Society to hold its meetings prior to the American Society of Orthodontists but, inasmuch as great numbers of allied, associated and subsidiary societies meet at the time of such organizations as the American Medical Association, the National Dental Association and others, there can be no reasons fostered why, as a matter of convenience, we should not meet according to this year's plans in relation to the American Society of Orthodontists.

I think it is with a great sense of gratitude that we should welcome those guests who have come to bring contributions of knowledge to our program and we trust that they will feel that degree of welcome and freedom which truly exists for them here and be as one among us.

There is nothing more gratifying to my heart than to make note of the fact that, with practically no exceptions, wherever an alumnus of the Dewey School of Orthodontia may be located, he is found to be strong and stalwart, with uprightness towards his fellow-men and free from any of those minor traits which detract from both the individual and the organization of which he is a member and, in noting the character of our Alumni Society in this regard, I would charge each of you to maintain those high ideals, that hunger for knowledge and advancement which sweeps all petty things before it and keeps us standing clearly in the field as true professional men.

In view of the fact that constant study is the only key to progress, I would say there are several correlated sciences to which I wish to invite your very serious attention. I believe that each of us should consider it his bounden duty to become familiar with endocrinology, nutrition, pediatrics and other associated sciences and I am firmly convinced that the next epoch marked in the advance of orthodontic science will embrace a broader field which will include in its scope a practical knowledge of these subjects. I

would not suggest that they be followed as a hobby or as a fad, but carried along with other practical progress.

There is one other matter which has occurred to me frequently this year which I would like to bring briefly before you. All of you occasionally run upon valuable literature, instruments, materials or the solution of difficult problems and I have thought how characteristic it would be of an alumni body if we would think enough of one another to pass these suggestions along even though it be only to have a postal multigraphed. So that we may readily adopt this policy, the names and addresses of the Alumni membership have been printed in the program.

In conclusion I cannot but allude again to the honors which you, my dear friends, have so bountifully conferred upon me. It is with a feeling of pride that I realize my entrance as an instructor in the Dewey School in 1912, broken only in the years 1917 and 1918, has given me an intimate personal touch with you which I greatly cherish and I am also proud to acclaim the fact that, through storms and fair weather, through abuse and laudation, and in matters of great policy or of small details, I have never found in Dr. Dewey but one and the same man, and that with his human interest, his scrupulous judgment, honesty of purpose and unerring integrity, he has developed those things which have brought us here together today.

For these reasons we may well be proud of the fact that our Society bears the name of the Alumni Society of the Dewey School of Orthodontia.

DISCUSSION

Dr. Sydney W. Bradley, Ottawa, Canada.—When I received and read our President's Address some few days ago, I was a little surprised and greatly pleased. I expected to read something very heavy, something which would be on such a plane above an ordinary practitioner's thoughts and ideas that it would be most difficult for me to say anything worth while about it. But you have heard and enjoyed it, and it sounded much better from our President's lips than it reads. It is a history of our Alumni Society, clothed in beautiful language and sweet thoughts that only men of the kind, loving nature of our friend Joe Eby can use.

I first met our President in 1915 in Kansas City. He demonstrated the making of the Jackson removable appliance to us there. I had never seen before, and have not seen since a technician who could bend and manipulate wire as did Dr. Eby. His demonstration was a revelation to me, and the presentation of the subject was just as splendidly done as was his technic on our models. His kindness and approachability made him our friend in a few hours, and we kept him busy from the time he came to the day he left us and nearly missed his train. I can see him yet with his grips and luggage around him ready to go and his taxi waiting, but Joe was still teaching and we were still listening and learning till the last minute. Finally we just had to pack him and his luggage into his taxi. He made the train but had not a second to spare.

His untiring energy and enthusiasm for the progress of our science is still shown to the present moment in the amount of work done in the meeting just closed. We have just had the best clinics we ever had at any meeting of the American Society of Orthodontists which I have had the pleasure of attending so far. And we owe to Dr. Eby our gratitude for securing them, and the splendid manner of their arrangement and presentation.

As I said before, I expected to have to try to discuss some wonderfully clever paper on one of the abstruse themes of our science, something similar to Dr. Timmes' essay perhaps, but I was pleasantly surprised for it is very difficult for the ordinary orthodontist to discuss such papers and problems, but I believe the mass and file of our specialty are reading and

studying more of the theoretical phases of our work than ever before. It is well, indeed, we are, for as John Bright said years ago, in an address on National Morality, that the nation dwelt in the cottage and not in the palace, so do I believe that the future success and recognition of our specialty depends upon the work and results of the ordinary, everyday toiler, just as much, if not more than on the work of our teachers. While we cannot and must not get away from correct mechanical forces and fine technic in applying them, we are, I believe looking more and more beyond this domain into the wonderful and puzzling realm of etiology. To try to solve this problem, we must study the biologic aspect of our work and form in our minds that general conception of perfect results, but at all times maintaining individual characteristics in the patient's facial contour and masticating apparatus. Even a superficial reading of endocrinology, nutrition, pediatrics and the allied sciences will show us that there are unsolved problems in our science, but until they are solved we are more or less groping in the dark. And we must remember, too, that this theoretical knowledge is the foundation of practical results. We cannot separate theory and practice. Professor Arthur Thompson in his book on "The System of Animate Nature" says, in speaking of the Aims of Science, "Science expresses a quite specific endeavor to get phenomena under intellectual control, so that we can think of them economically and clearly in relation to the rest of our science, and so that we can use them as a basis for secure prediction and effective action. Knowledge is foresight, and foresight is power. The direct motives of science are in the main, intellectual curiosity, a self-preservative, dislike of obscurities, a desire for unity and continuity in outlook. Often, in particular cases, the immediate motive may have been utilitarian—a desire for mastery, but the great majority of important practical discoveries have behind them a long labor of theoretical research pursued for its own sake."

Dr. Eby spoke about changing the dates of our meetings to follow rather than to precede those of the A. S. O. If this pleases the majority, it is best. To my mind it does not matter when we hold our meetings, but I do think a two-day session is long enough, especially when linked up with a three-day session of the A. S. O.

I hope our Alumni meetings will continue to be the success they have been in the past and that real benefit to our specialty and to ourselves as individuals will result from them. After all, that is the important thing to us as a body of scientific men, the application of the results of scientific study in producing healthy bodies and beautiful faces. Can there be more noble aims in the realm of either the arts or the sciences?

Dr. George B. Crozat, New Orleans, La.—Mr. President, Members of the Alumni Society of the Dewey School of Orthodontia and Guests: I wish to compliment Dr. Eby on the excellent manner in which he has presented the history of the development of the Dewey School of Orthodontia, and the Alumni Society. Those members present who have attended the meetings in the past few years can appreciate how this Society has grown yearly from the few graduates composing the first classes to its present size.

The willingness of essayists to appear before the Society as referred to by Dr. Eby has no doubt been very gratifying to the officers of this Society, as well as to the members. It is evidence of the generous spirit of the men who have appeared before this body and their interest in the progress of the science of orthodontia, our school and organization.

The essayist referred to the suggestion of Dr. Purcell in his President's Address in 1917, in that the organization instead of being an Alumni Society that it be made a scientific society of orthodontists admitting any one who so desired to membership. It is well that this suggestion was abandoned at that time, as we can now more fully appreciate the family spirit that prevails in our Alumni Society and our desire to welcome the guests among us. There was no necessity for a second scientific society, in view of the existing American Society of Orthodontists. The founders of that Society possessed those superior motives and ideals which fostered the research and advancement of orthodontia, and gave to the orthodontic world of today the Society it is.

Regarding another topic discussed in the address, namely, the revision of the Constitution and By-Laws, I think it would be well to appoint a committee in accordance with Dr. Eby's recommendation, to revise the Constitution and By-Laws, and bring them up-to-date.

I am in hearty accord with what our President has said relative to its being unwise

for our Society to hold its meetings prior to the American Society of Orthodontists, and I see no reason why we should not continue this year's plan.

In conclusion, I wish to thank the President for his courtesy in having forwarded me a copy of his address which has made possible the preparation of my discussion.

Dr. Adelbert Fernald, Boston.—I wish to make one or two remarks in connection with the President's Address, which I have enjoyed very much. I would like the President and members to know that I have collected and have on file the annual reports of this Society from the beginning down to the present day. These reports are on file in the Harvard Medical and Dental Library for future reference, and if any member wants to refer to them, all he has to do is to see the librarian of the Harvard Dental School.

Dr. O. A. Oliver, Nashville, Tenn.—I wish to express my appreciation of the excellent address that Dr. Eby has given us. He has covered the entire territory so well that all I can say is to congratulate him and the Society on it.

WHAT WE HOPE TO ACCOMPLISH IN OUR EFFORTS AT ORTHODONTIC TREATMENT*

By T. G. Duckworth, D.D.S., San Antonio, Texas

IN attempting to correct a deformity which has occurred through lack of development or as a result of a perverted condition of the mouth and jaws should be with an idea of establishing, first occlusion of the teeth and next the preservation of the teeth and last to bring about the appearance.

From the standpoint of the laity this condition is reversed and 90 per cent of our patients come to us for purely esthetic purposes, then comes the possibility of the care of the teeth and last the relative position of the jaws and teeth in respect to mastication.

The term articulation is frequently used instead of occlusion in describing the movement of the teeth in one arch over the teeth in the opposing arch in the act of mastication and should be differentiated, as the function of articulated bones is different from the function of the teeth.

Normal occlusion of the teeth is a normal relation of the teeth and their cusps of one arch to the teeth and cusps of the opposing arch, and is Nature's well arranged plan according to the individual type and carries with it the ideals of heredity, while on the other hand malocclusion is a deviation from the normal to the extent of interfering with mastication and is the result of a congenital or acquired condition. All cases of malocclusion or maldevelopment are divided into classes and each class is typed for the purpose of treatment and for the convenience of description. The causes of maldevelopment are many, but generally always apparent and work in conjunction with one another in producing various conditions met with. Every tooth bears a certain relation to the approximating teeth in the same arch as well as to the teeth in the opposing arch and they in turn determine all dentofacial outlines as to balance and function.

*Read before the Southwestern Society of Orthodontists, Oklahoma City, Okla., April 22, 1922.

The efficiency of a denture is dependent upon occlusion and as health is dependent on thorough mastication it is evident that a majority of our children, as well as adults, are not getting the full benefits of their masticatory apparatus.

Orthodontia, we might say, is a borderline specialty as our attention is repeatedly called to the condition of the tonsil, adenoid, breathing, chest development, bone growth, nutrition and to such diseases as would tend to retard or prevent our efforts at treatment.

The application of stress or force upon the teeth through the medium of regulating appliances must be constantly and evenly applied in order to physiologically stimulate cell activity, thereby causing the teeth to assume and maintain a position in normal alignment and as the alveolar process is subservient to the use and maintenance of the teeth and the maxilla and mandible all receive sufficient stimulation to bring about most any desired change in facial outline. The most beneficial example of growth and development is the changing of narrow, constricted arches with an undeveloped mandible that is distal in relation to the upper arch and with a protrusion of the upper anterior teeth and typical chronic mouth breathers to normal, healthy individuals. The establishing of nasal breathing by expanding the dental arches and placing the patient on exercises brings about the general development of the body and is especially pleasing in respect to mentality and lungs. The effect of orthodontic interference is far more reaching than possibly some of you realize when the work is carried out correctly. In any event it takes two to make a bargain and sometimes several to get a result. This is the position we are in regarding some cases, as in any case of orthopedic surgery it requires months and sometimes years to get satisfactory results and you must have cooperation or the work will prove a failure. Fortunately most people are amenable to reason when appealed to in the proper spirit and correct their negligent ways.

It has been the advice of many dentists to delay orthodontic treatment until the permanent teeth are fully erupted, but the orthodontist realizes this advice is equivalent to counseling parents to wait until the case gets as bad as possible, then to correct it. The earlier a case is treated the better for all concerned, as it requires less time, the results are positive and we can exercise better control over the patient. As an example, should we find a child three years of age suffering from malnutrition due to faulty mastication as the result of irregularities of the deciduous teeth they should be corrected and not delayed. Preventive measures are carried out at this early age which insure normal development of the bones of the face and the proper eruption of the permanent teeth. There are of course a number of mishaps of a traumatic nature that would seriously affect the final outcome of this early treatment. Modern medicine has definitely demonstrated that practically every disease proceeds from external cause and presents a specific set of chemical, functional, and structural changes from the normal, and to say that the institution of preventive measures would insure normal development in the future and that it would bring about the proper eruption of the

succeeding teeth, would probably be going too far, but it does offer the individual every opportunity to ward off disease and to take advantage of the best environmental conditions. Eruptive fevers play havoc with our chances for normal occlusion in many cases as there is a gradual disintegration of the enamel which brings about the loss of contour and broken approximal contact points which are essential to the maintenance of the teeth in their proper positions. Again, we find a gradual state of evolution existing in respect to the third molars or wisdom teeth that is often perplexing. The third molars are generally imperfectly formed, crowded or impacted, and frequently missing entirely, which can only be accounted for through the development of the forebrain at the expense of the jaws. The eruption or partial eruption of the third molars takes place after the seventeenth year and it is through their attempts at eruption that the anterior teeth are crowded and misplaced, which is the undoing of many cases of regulating and the production of many new ones. The presence of the third molar in the dental arch is often a source of trouble and is seldom considered an important factor in mastication, in fact the extraction of these teeth often assists in mastication. The preservation of the teeth is made possible through continued effort and where we can lessen this effort it is more probable that the mouth will be cared for with less injury to the teeth through decay and the gums will be subject to less irritation and free from disease. It is almost impossible for anyone to properly polish and remove deposits, such as salivary calculus, tobacco stains and rough surfaces of enamel from teeth that are crowded, overlapped, or partially impacted. When the teeth are regular in form and shape and the occlusion is correct they are more or less self-cleansing through the action of the saliva, lips, tongue, and cheeks. The excursion of food over the surfaces of the teeth in the process of mastication will prevent the forming of plaques which tend to seal the organisms next to the enamel with consequent dissolution of the cement substances between the enamel rods. With ordinary use of the tooth brush and rinsing of the mouth with deodorants the toilet of the mouth can be well maintained.

Having considered occlusion and the maintenance of the teeth, esthetics should not be neglected. Any one with personal pride wants to look and appear as well as possible, but he should not let his vanity get the advantage of his best judgment when it comes to the teeth as we are not infrequently called upon to extract some tooth that is out of line and presents an unsightly appearance. Should we consent to follow out the wish of patients and extract these teeth it would absolutely defeat the object which they wish to bring about, namely, the appearance. For the time being it may improve, but finally the remaining teeth in the arch begin to drift and when they permanently come to rest the occlusion is destroyed and the appearance is no better than it was before the tooth or teeth were removed.

The most depressing thing is where parents have the permanent teeth of their children removed with the idea that too many teeth are present and that the remaining ones will straighten out by themselves, and never seem to realize that the children may some day wish to have their teeth regulated

on their own initiative and at the same time get normal results which would be impossible since some of the teeth had been extracted. When extraction is resorted to with an idea of establishing normal occlusion of the teeth then it is simply an attempt to dodge the responsibility, and one cannot hope for more than a compromise, which means extracting some tooth or teeth in order to rearrange the others for the sake of bettering the condition and with no hope of establishing the normal, and is indicated only in patients of advanced age. The extraction of impacted third molars and supplimentary teeth would be indicated as an aid to treatment.

Frequently the first permanent molars are lost very early, which produces a marring effect upon the facial outline that could be prevented if it was realized that the teeth were permanent ones and that they are the most important teeth in the arches as they determine the position in which the succeeding teeth must erupt and the size of the arches which are always diminished in length and in breadth as a consequence.

Nature has been very kind insofar as it concerns the size and shape of the individual teeth and it is only in isolated instances that we find a case where the relative mesio-distal width of the upper teeth is greater than the corresponding lower ones or vice versa. There is most always a fairly constant relation of the cusps, and in the number of cusps on each tooth, which makes it possible to restore a perverted condition as all the tissues associated with the mouth are subject to change, and respond to mechanical stimulation except the enamel. Appearance is dependent upon the formation of the enamel as well as the arrangement of the teeth and relation of the bones of the face. There are conditions of the enamel such as stains or imperfect deposition of lime salts that preclude any possible improvement in the color or shade of the teeth. In some sections of the country the teeth become mottled through the water that is used or at least this is the supposition and is of considerable concern. The structure of the enamel does not seem to be impaired, but the deep, dark stain that covers the surface of all the teeth in some cases is a great objection.

In patients of advanced age, where malformation exists, especially in cases of overdeveloped mandible, it is a difficult thing to get sufficient recession to restore all the features of the face. These patients, however, cannot expect a complete change in the contour and are generally content with any improvement that we can make.

In diagnosing cases it requires considerable preliminary work in the way of making original models, facial casts, photographs, x-ray examinations (intraoral and extraoral) which enables us to fairly well estimate the time required for the treatment. The case history will give us information that is of vital importance and without this history we are very likely to promise patients more in a corrective way than is possible to accomplish, and is especially true in children that have suffered with rickets, eruptive fevers, accidents, etc. I have x-ray negatives of a case with me which are very interesting. A boy fourteen years of age who gives a history of an accident that occurred several years previous to the examination which shows that

the alveolar process and labial portion of the maxilla was forced to the lingual in the region of the superior cuspid on the right side. At the time of the accident the deciduous teeth were present and the permanent cuspid was only partially formed, lying in the crypt which was misplaced, and as a result the odontoblasts became inactive and the enamel portion of the tooth was found encysted and had to be removed. The antrum was partially closed and as the cuspid did not form, the eminence was destroyed and the right nostril was very narrow and constricted with the facial outline, anything but pleasing. The best we could promise this child was a compromise, as the attachment, namely, the cuspid, which is a long tooth embedded high in the process, is gone and it means opening up the space and inserting an artificial substitute which precludes any chance of restoring the features except in a limited measure. The bicuspids, however, are being moved to the buccal in the general expansion of the arches with the hope of opening up the nostrils and relieving the buccal walls of the antrum. The scar-tissue over the region is going to be a hindrance to the maintenance of the parts in their new position and must be controlled through exercise and massage. The tissues of the oral cavity will stand a great deal of abuse, due to the free supply of blood to these parts, even though some of the bony structure is misplaced, if nothing is missing, the appearance can be established in most instances. It is a fact, however, that apparently simple cases will not yield to treatment, which is no doubt the result of complicated etiologic factors and our inability to combat them in the absence of any exact knowledge of the peculiarities of development which can be applied to the case. We cannot foretell in advance of treatment the rapidity with which bone growth will take place; and with all modern means at our command in analyzing the condition we occasionally run across a case with which we blunder along with a mixture of happy hits and unfortunate misses and never get what we desire in the way of results, although fine technic and skillful operative methods enable us to reduce these failures to the minimum.

We have many types of children to deal with which are in varying stages of development, and our chances are great in studying the details which bring about the most satisfactory results; it also enables us to see the advantages and disadvantages of certain forms of appliances used when treating young children, also those employed in older children. The age may range from three, four, and five to fourteen, fifteen, and sixteen. Anxious parents are extremely grateful for any assurance of a successful and permanent result, and it is only in the very young children that we can rely upon the results as being permanent without a great deal of discomfort to the patient in wearing retaining appliances over an indefinite period.

I believe it is possible to fulfill the demand of science in orthodontic procedure, but this necessitates a close study and a more intimate knowledge of the habits of bone growth and of the tissues we are to operate upon, for let us remember that we can do nothing of permanent value by ourselves in our efforts at treatment, but only as we work in conjunction with Nature, studying her carefully, interpreting her wishes and intelligently assisting in her

efforts of growth and development. Fortunately we have some wonderful chapters on histology and embryology, and a study of these must convince us of the most active period of development. The beginning and ending of calcification of the osseous tissue should be a guide in assisting Nature to build the parts in harmony and according to normal influences. If we are going to allow abnormal influences to intervene at three years of age and then correct them at twelve, our motives must be other than the importance of a full complement of teeth well arranged, and the very important part that each tooth plays in its relation to all other teeth of the denture, that the denture may not only be in function most efficient, but that it may contribute its full part to the normal beauty and balance of the face according to the individual type, and also its normal part in the possibility of normal growth and development of the throat and nose, all of which are so essential to the health and growth of the individual. To recognize and combat abnormal influences in their early stages, means a great deal towards prevention, and while in itself not complete, will aid materially in treatments and shortens the period of retention.

Cleanliness of the mouth must be observed during the treatment, and if the appliances are adjusted to temporary teeth to the extent possible, we can avoid injury to the permanent teeth which would otherwise occur at least to a limited, if not to a greater degree. The actual movement of the teeth apparently seems to be accomplished in the older patients almost as readily as in younger children, but the retention in the older children of twelve to fourteen is never positive in my experience. I do not mean that the arches collapse entirely or that the teeth go back to their original position, but there is invariably some crowding of the anterior portion of the arch with one or two teeth slightly overlapping on the lingual or buccal inclination of some tooth. This condition of affairs spoils the effect of one's efforts toward an ideal result and lessens the hope of ever obtaining what is ultimately desired in these cases.

A number of cases, no doubt, have failed in our hands even after prolonged retention, due to our inability to recognize and correct abnormal influences which continue to act after the retainers are removed. It is often surprising, the cooperation received from some very young children and the instructions to these patients are more religiously carried out. The mother assumes the responsibility of seeing that the child keeps all the appointments and at this early age other allurements have not the attraction to keep the patient from the office, that they have at a later period in life. If the child is supplied with new and correct guiding impulses it is more apt to acquire an ability to combat abnormal influences, bringing about coordination of muscle groups and a complete control of their muscular mechanism. This must in time have a beneficial effect upon the parts we are directly concerned in and our teaching has accomplished what later would have been done by mechanical interference, with a useless waste of time and treasure. From the beginning, an individual is constantly surrounded by influences and environmental conditions that ultimately establish the character and development

of the parts, and unless every precaution is observed against interference to health and harmony of functional adjustments, disease and inharmony will reign.

Every evidence of interference should be discouraged at its incipiency so as not to allow the parts to lose their normal activity in the slightest degree. The solution of our difficulties should and I believe will soon be largely one of prevention; at least, we will be able to so govern the patients that they can be brought to realize the responsibility of their own destinies, to the extent of reporting to the orthodontist early enough, so that preventive measures may be adopted and the slight maldevelopment corrected. This would insure the parents of the necessity of looking after and caring for the temporary teeth, and the importance of their proper retention and loss, and the influence they bear in reference to the permanent set.

The tonsils and respiratory passages should be thoroughly examined for the detection of any probable interference from these sources; in fact, each of those forces which tend to produce inharmony of the parts should be eliminated and the attention of the parents called to their probable correction. We should lend to Nature a little assistance during her early developing period, at a time when the balance between normal and abnormal is nearly equal and the influences of an abnormal nature are fast making themselves apparent. The natural forces, such as cell metabolism, forces of the inclined planes, normal approximal contacts, harmony of shape, and sizes of dental arches, atmospheric pressure, muscular pressure and such interferences as may be grouped under the heading of mental, respiratory, and postural, may be encouraged to assume their natural attitude toward building the dental apparatus along natural lines and in keeping with the individual type. Greater efficiency in development and greater rewards from the standpoint of health must be the result of this early attention. The chances are just as great and as necessary or even more so in teaching children how to prevent abnormal influences as it is to teach them to overcome certain influences, and even though the opportunity has not presented itself for such instructions until after some mechanical correction is found necessary, it will at least prevent further deflections in proportions to the degree of thoroughness in which the instructions have been given, and the sincerity in which they are received and carried out.

Occlusion after all is the important factor to be considered as it is viewed from an imaginary line established by Nature in her most perfect dentures and is applicable only to the case in hand as it is impossible only to approximately predetermine the size and shape that an arch should be. When the teeth are arranged in the line of occlusion either naturally or by means of mechanical interference they are then normal and all the associated bones and muscles of the face tend toward harmony, and work to the perfection of the individual in symmetry and beauty.

SOME OBSERVATIONS IN REGARD TO THE MANAGEMENT OF OUR CLIENTELE*

By William Roy Humphrey, D.D.S., Denver, Colo.

THE practice of orthodontics, as we all know, throws us into very close relationship with children, and it can almost be said, that if we are successful in the practice of orthodontics, we are lovers of children. In the Gospel of St. Luke are found the words, "It were better for him that a millstone were hanged about his neck and he cast into the sea than that he should offend one of these little ones."

We have these children as patients in most cases for a period of time, much longer than the average practitioner of any kind, and therefore in more instances than we are aware of, have something to do with the molding of their ideals and ambitions. As they are, of course, at a very impressionable age, they are as clay in the hands of one who has gained their confidence. And though we may not always be cognizant of the fact, many of our words and actions make a deep impression on their minds which may be secretly nursed until they really affect the child's future; at the same time, neither the doctor nor the patient realizing their origin.

Since the greater part of our clientele is made up of children, most of these observations are applicable to them. There is no need of saying there are many varieties, and what might be considered good management for one and what might even have proved to be good; it is obvious that it would not be good management for another. Therefore, it seems to me that any line of management that one gives must only be considered in general. It is my object, therefore, to treat the subject in a general way, citing certain examples from my experience as well as from the experience of others.

We very often hear this term used, "He is a normal child." I have often thought of this remark and I arrived at the conclusion that all children are more or less abnormal. The normal individual is an ideal. We get our norm by striking the average; those who deviate are "ab" or "sub" normal. If you will permit me then, I will say that most children are abnormal.

First of all I will mention several of the methods that I have used to advantage in treating them as orthodontic patients. It was suggested to me, shortly after I entered the practice of orthodontics, by Dr. A. H. Ketcham of Denver with whom I am associated, that I study psychology. I have studied it somewhat for the last few years and in reading different books upon the subject, I became interested in the newer psycho-analytic method, especially as expounded in the work of Dr. Edmund Freud who, if not the cre-

*Read before the Rocky Mountain Society of Orthodontists, March 7, 1922.

ator of the science, has certainly been its foremost exponent. And since he practiced his theories for many years before he began writing and teaching them, we may say that his work has come out of the laboratory and not from the library. We believe it is sound and has real merit. The following is taken in part from his work: (a) "All functional neuroses or nervous disorders have their origin in the experiences of early life; some fearful or otherwise abnormal occurrence has created the difficulty or the complex which is the term now current. (b) These fears or irregularities upset the whole nervous organism. This fear or developing complex seethes in the background of conscious thought, or even in the subconscious mind, growing constantly larger and more menacing and demands discharge or expression—always in a perverted form."

We have the doctor to thank in these statements for scientific proof of a fact which we have always more or less recognized; namely, many patients have been utterly ruined by mismanagement when children. They have developed a dental complex. I feel quite safe in stating therefore that a very important part of the management of children, as patients, is the first visit. The best way to greet children, in my mind, is cheerfully. A smile will do more to gain the confidence of one of these little people than will many promises. If it is the first visit the child has ever made to a dental office of any kind and we greet him very cheerfully and proceed in a natural way without nervousness or haste, being careful to do nothing to hurt or frighten him, we will find it very easy to gain the confidence of this impressionable little person. It is always our custom to take impressions with modelling compound at the first visit, so that study casts may be made from which to make a diagnosis. Plaster impressions are taken at the beginning of treatment. It has been Dr. Ketcham's custom, and I follow it, to mold something from a piece of the modelling compound and give it to the patient, for example, a small hat, a marble, or a basket. The child is then interested above all in its new possession and if anything lingers in its memory, it is what you have made rather than your operation. If it is necessary to make x-ray exposures, which it usually is, an explanation of the pretty light and telling him you are going to take a picture of something we cannot see will only make the friendship more secure. Before going further, we will take an instance where the child has been to someone, who either thoughtlessly or carelessly has not been tactful to the extent of building up the proper confidence. Our procedure may vary. It is best in my mind to have a patient of this kind to one's self if possible. Perhaps, if it is one of our younger patients, it is well to question him as to what he likes best of all, and then pretend that you are greatly interested in this same subject. I use this a great deal even with my older patients and by merely being a good listener and furnishing an appreciative audience for the recital of their pet hobby, I am almost sure to gain their confidence. This slight deception if used tactfully, has proved advantageous to me and I have really become interested in many of the things brought out by these children. In case some one might misunderstand me I would say that to

practice any deception is dangerous. A child as a rule will very quickly sense the deception. But you can with very little effort be really interested in the child's hobby. After I have succeeded in gaining their confidence, I then proceed just as if they were perfectly accustomed to the sort of thing and in my experience usually succeed in laying the foundation of a good patient and a warm friendship. There are some few children, however, that do not yield to any of our reasoning and simply "balk" so to speak at all attempts at applied psychology. These are usually children who have had little or no home discipline or perhaps are subnormal. And it is sometimes necessary to persuade them almost to the extent of forcing them to permit an examination. However, this is surely the very poorest form of management and when resorted to, in my mind, simply proves our lack of proper methods and to some extent points out the need for some study along these lines. Many have almost been forced to undergo an examination and afterwards have proved themselves good patients because having experienced something which they abhorred and found it much better than they expected. The reaction is very likely good.

Since first impressions, if not lasting ones, are surely important ones, I believe it the very best judgment to be cheerful, kind and sympathetic. For that matter, I find that even after a patient has reached the postoperative maintenance stage of treatment, he still appreciates a cheerful greeting. This is one thing that children never tire of. It surely is not necessary to be a clown or is it wise, in my judgment, to use a stereotyped joke or a worn out phrase as a greeting, for after a few visits they appreciate your remarks and the novelty wears off. Do not mistake me; I do not think the patient is coming to be entertained; but if his visits are pleasant, I believe our work will be materially benefited.

We will have no great trouble with the so-called average child if we proceed carefully, using diplomacy and not tiring him at our subsequent appointment. I want to remark on two other important things which have helped in my experience. After an appointment where some appliances have been constructed, or any operation performed which has taxed the patience, it has always been our custom to reward the child with a cup of hot chocolate and cakes, or ice cream during the warmer months. And with the younger patients, during the operations, we have always had one of the nurses read to them some story selected particularly to their liking.

The other thing, which seems to me as very important in the management of our little patients, is always to keep them enthused over the beautiful dental apparatus we are developing for them, with their assistance. We can hardly lay too much stress upon this because in talking with even the younger patients, they have often remarked how much depended upon the development of the dental arches, not, of course, in these words but beautifully described as only a child can put things. Of course, in the younger patients, they are merely repeating what you or someone else has told them. There is a saying, however, that if you tell a person a thing often enough he will not only believe it but repeat it himself.

Since one can always work to a greater degree of accuracy and with the expenditure of less nervous energy when doing a thing for one who is in sympathy with the operation, I consider it very important to imbue the patient's mind with as much enthusiasm as possible over the event of attaining a normal balance of functional forces and the development of the associated organs. While, of course, this must be done with the most elementary methods, even with the older patients; I find it can be done and, in some instances I have known of children as young as ten years of age explaining to their playmates about how they would be benefited aside from the cosmetic part of the treatment.

It is not uncommon to hear a well educated adult of the laity express much surprise over the facts of orthodontic treatment, which are, of course, common knowledge to us. To my mind then, one of the important things in the management of our clientele is to give some time to the development of appreciation for the ideal in the minds of our patients.

There are a few types of children that I have observed, and they have caused me some vexation, but before I take up a very limited number of cases, I wish to quote from Dr. Alder, another psychoanalyst. While he seems to agree with Dr. Freud in most of the important phases of the subject, he does not agree with him in regard to the causes of all the difficulties. He takes organ inferiority as a first cause, and in reading some of his teachings I found one especially that I consider worth giving you, as it has partially, at least, cleared a few things in my mind. The following is taken, in part, from W. H. Burger and is based upon Dr. Alder's theory of organ inferiority, "It means simply this, if a child, who is physically deficient in some respect, either with regard to external organs, particularly the sexual, or the internal, as the stomach, will be sensible of its inferiority whether consciously or not, and will try to make up or compensate for its short-comings. In the process of attempted compensation its conduct may assume many absurd forms, not only as a child but as a youth and adult. Because of inferiority, it tries to make its place secure. It imagines that it has powers it does not really possess. It lays out for itself a fictitious course of mastery over others and its surroundings and start toward the goal. It lives in a realm of 'accentuated fiction' of unreality. It experiences periods of intense ecstasy as it contemplates its glorious powers. But as soon as these come in conflict with reality, with life as it is, there is just as intense depression. It practices asceticism, abuses the body, disparages others, and even is most punctilious in observing the proprieties, as in social intercourse. It may always be on time in keeping appointments, just to demonstrate thereby its innate superiority to others who are not. So it runs down and depreciates self just to show how humble and free from conceit it is. The implication is always that it is in these and other respects superior." They develop a superiority complex. This theory of organ inferiority seems to me to possess merit. It was a new thought to me and I give it to you for what it is worth.

We all recall the boy, in our own childhood, who was the last in and the

first out of the swimming pool; who never played games which were rough; and also the one who loved to sit all day and read wild fiction. In one instance, I knew of a youth who could do beautiful needlework. Boys called them "nuts," "freaks," and "sissies," but we must remember they were not always so. Freud, Alder and many other writers agree that in order to help one of these individuals to assume the position in the scheme of things for which he was created we must start at the beginning, or at the place where the patient first began to foster the idea; and it is usually in early childhood, and since we have the child observation at that time, much mutual benefit could surely be derived from observing these irregularities. However, since we are not treating nervous disorders I wish to explain that I am of the opinion that many points in the interest of the management of orthodontic patients can be taken from this theory. I have in mind a patient, a boy, who fits into this class of individuals perfectly. His case required the corrections of posteroocclusion, and of the many cases it has been my privilege to observe here, he comes about as near being inoperable, from the standpoint of lack of cooperation as any. He surely is suffering from "ego," a swelled head, or if you like, a superiority complex. An example of his wild dreams and accentuated "ego" might be found in a remark he made to me. I often ask my patients what they want most to do when they grow up. He told me the following, "Oh, perhaps, I will go into the Diplomatic Service for a short while; I should prefer, however, to accept some position in the capacity of a foreign representative of our government in the country of one of the greater powers." At the same time, he has no pride in his personal appearance and no regard for dental hygiene. He is much underweight, has poor eyesight and is irregular in his habits. The boys of his age call him a "nut" and, as I stated above, although we are, of course, not in the practice of the psychoanalytic system or interested in the cure of such difficulties to any great extent, it is, at least, interesting to note that since we have no little difficulty in treating such patients, it would seem to me that any study we might do along these lines would help in the management of such patients of our clientele, who lean in just a slight degree to these different irregularities. A suggestion at the opportune moment may be of great value in the adult life of our patients. There is not one of us present who cannot recall some person who made a deep impression upon us, as children. Most of us can recall a grouch, some old gentleman, who, either suffering from excessive ego or some systemic disease, simply hated the sight of children. Remember how we loved him? Most of us can also recall kind, cheerful folk who were an inspiration to us. Also the superdignified people whom we humorously imitated. And from among these various people of different types, we surely got many of the ideas and actions we now employ.

In the presence of children we cannot be too careful of our words and actions. Children do not change to any great extent as generations go on. A child of today is pretty much the child of yesterday. It is our own advancing age, in most cases, which seems to set the stage and make the pranks

of our own childhood assume mischief of a greater magnitude. I have in mind two other types which I wish to refer to very briefly. Time and your patience will not permit me to cite many cases, but if I can provoke a discussion of your experiences, we may yet learn something this evening.

The next type of child is most commonly found among boys, and may be designated "Fresh Type." Among boys, the type very often expresses itself in the form of a "Bully." With girls, they are usually lovers of themselves, as is the "Bully," but they manifest their superiority or freshness by showing their importance. I have known of girls removing their appliances, and when questioned as to the reason, might simply say, "Oh, I was going to a party and wished to take them off." The boy, of the "Fresh Type," is usually a "Bully" among those younger than himself and disrespectful to his elders, but with boys of his own age, he is very often a coward.

To suggest a plan of management for this type is indeed difficult. I have studied how boys, or girls of their own age deal with them. I find for the most part, they ignore them. We can surely learn from this. And as we all know them to take advantage of any privilege extended them, I think that here is one place where reserve and dignity are advisable. "If you give them an inch, they will take a mile." I recall one boy addressing me as, "Well, Old Topper, if I want to run around here what are you going to do about it?" We should surely conduct ourselves in such a manner with this type of patient, to compel respect. Very often this is difficult, as these patients in most cases come from homes of wealth where, surrounded by servants as they are, and having everything, they are surely poor material as orthodontic patients. We may be happy that they make up a very small per cent of our practice. I merely mention them as a type and wish to remind you that I firmly believe that children are prone to laugh at the pranks of such a child, and that their association with one has little effect upon them, if they themselves have the proper environment.

The other type, and the last, I wish to mention aside from the subnormal child, is composed of those who are suffering from an inferiority complex. These are by far the most common, and most of us are affected with this irregularity ourselves to some extent. These children for some cause or other are a little timid at the approach of a new undertaking; some to the extent of actual fear. Even in adult life we see people, when confronted by a new project, so fearful of the outcome that they throw up the whole undertaking. This type of child is much more easily managed than the other types, and anything I have said in regard to building up confidence or appreciation of results applies to them as to the so-called normal or average child. perhaps tempering our procedure with more sympathy as the case may require.

With the subnormal child, I think a line of action corresponding with the mental age is a good manner of procedure. For example, I have been able to get good cooperation from a subnormal patient, twenty-one years of age, by talking to him as we would to one ten or twelve years old by telling him I can surely depend upon him to do things, etc.

Since the title of this paper is, "Some Observations in Regard to the

Management of Our Clientele," I wish you would take these remarks in the spirit intended. I would not attempt to dictate any line of management of our clientele to anyone. It is largely a personal matter, but I would suggest, especially to the younger members of our profession, who have not had the hard but good teachings of experience, to avail themselves of some of the writings on children (Management of the Child, Child Problems, etc.), the principles of psychoanalysis, and some works on psychology. I will not attempt to name them or the authors. Their name is legion. I will simply say that when I first looked over the lists at the library I came to the conclusion that everyone, with the exception of myself, had written upon some subject pertaining to children. The material is almost inexhaustible.

In conclusion, I wish to say that aside from the pleasure derived from reading the different materials for this paper, the most benefit that I have realized is this: I have resolved to try and form the habit of applying the psychoanalytic methods to myself. As I step into the office in the morning, I would like to say to myself, "Above all, am I cheerful? am I kind? am I sympathetic? and am I in earnest?"

This concludes my observations, but in addition to giving credit to Dr. Freud, Dr. Alder, Mr. W. H. Burger and other writers on the Child, I wish to give credit to Dr. Ketcham for the privilege I have had in observing some of his office procedure.

BIBLIOGRAPHY

[1]General Introduction to Psychoanalysis.
[2]Psychopathology in Every Day Life, Sigmund Freud. Child's Unconscious Mind, the Relation of Psychoanalysis to Education, Lay Wilfrid. Boy Behavior, W. H. Burger.

"THE HOWARD MODEL PLANE AND MEASURING INSTRUMENTS"*

By Jos. D. Eby, New York, N. Y.

THIS clinic is for the purpose of demonstrating the Howard Model Plane and associated measuring instruments in action.

The machine has been designed and produced by Dr. C. C. Howard of Atlanta, Ga., expressly for orthodontists.

Its purpose is to eliminate many of the time taking phases of model trimming and to produce that degree of uniformity and accuracy which characterizes perfect machine work as often being more uniform and superior to that done by hand.

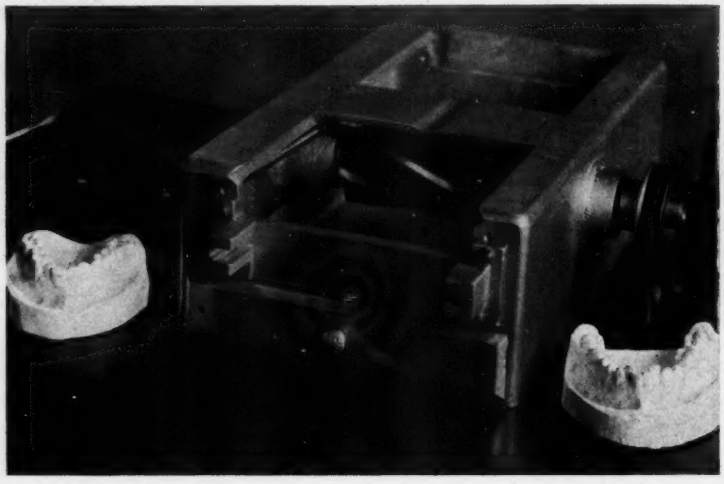


Fig. 1.

The apparatus is motor drawn and is mounted on a convenient sized table with electric switch well located and all but the cutting cylinder and carriage portions are well protected from the plaster cuttings; beneath these is a removable tray in the form of a drawer from which the plaster trimmings are readily removed (Fig. 1).

The only instruments required in the work which are not original in design are a bevel and a divider.

Two small instruments especially designed for determining the general occlusal planes of the teeth and to measure and mark the artificial portions of models are most accurate and unique in the designer's originality (Fig. 2).

One portion of the apparatus which works in conjunction with the before described instruments is the adjustable "diagrammatic measuring table."

The markings on this table are so finely placed as to make it possible to

*Clinic before the American Society of Orthodontists, Atlantic City, N. J., April, 1921.

instantly establish vertical and horizontal lines, right angles, forty-five degree lines and other measurements which may be also transferred from occlusal points to the backs of models by means of a cord stretched tightly between two upright posts which correspond to the edge of the measuring table so that the model can be marked beneath (Fig. 3).

The "model carriage" is a remarkably well designed mechanism for carrying the model securely over the cutter; the carriage is designed to clamp models directly for cutting bases and also has an additional part which is screwed into place for cutting the backs and the sides of models, either separately or with the uppers and lowers in occlusion (Fig. 4).

Fig. 2.

Fig. 3.

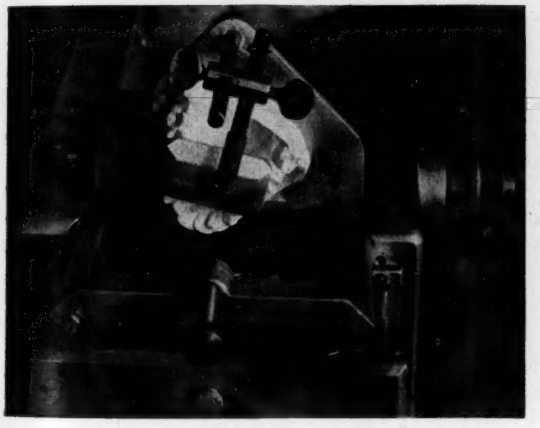


Fig. 4.

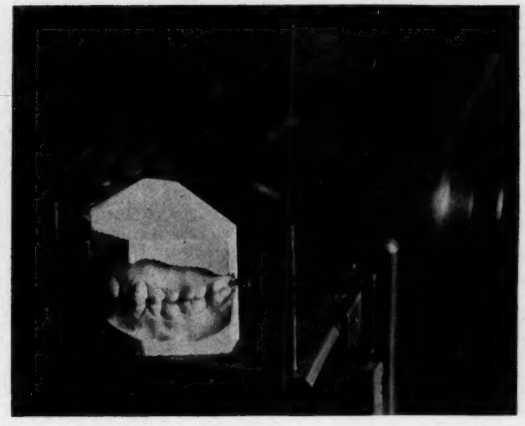


Fig. 5.

It is quite impossible to cut one's self or to cut into any of the anatomical portions of the model because there is only one way in which models may be mounted into the carriage and only one way by which the carriage can be inserted into the milled grooves which carry it over the cutter.

The cutter is protected by an adjustable steel plate cover attached by springs which hold it over the cutter at all times except when the carriage containing a model is passing across and the machine should never be running excepting at these times. (See Fig. 1).

After becoming adapted to the machine, perfect sets of models may be trimmed in from ten to fifteen minutes (Fig. 5).

The clinician explained the machine thoroughly, also trimmed several models in order to demonstrate the methods of trimming and exhibited a series of photographs illustrating all positions of the machine as well as all of the stages of model trimming in detail.

HISTORY OF ORTHODONTIA

By Bernhard Wolf Weinberger, D.D.S., New York

(*Continued from Vol. VI, 726.*)

MORTON SMALE, M.R.C.S., L.S.A., L.D.S., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S., *Diseases and Injuries of the Teeth*, including Pathology and Treatment, 1893, under Chapter II, Abnormalities and Diseases of the Temporary Teeth, we find the following classification: "(a) abnormalities in size; (b) abnormalities in number; (c) abnormalities in position; (d) abnormalities in structure.

"(a) *Abnormalities in size.*—By abnormality in size is meant a variation from the normal, as, for instance, when one or more teeth are comparatively larger or smaller than the rest of the set.

"(b) *Abnormalities in number.*—By abnormalities in number is to be understood either any excess or deficiency in the number of teeth found in the temporary dentition.

"(c) *Abnormalities in position.*—Abnormalities in position are of two varieties—those relating to malposition of individual teeth, and those that have to do with the relative position of the maxilla to the mandible. The only form of irregularity of the first variety which has come under the authors' notice is a slight crowding which leads to overlapping and twisting of the incisor teeth. In the second variety there are three more or less common conditions—(1) Protrusion of the lower jaw. (2) Edge to edge bite. (3) Lack of anterior occlusion (open bite).

"(1) Protrusion of the lower jaw is occasioned when one ramus is developed out of proportion to the other.

"(2) Edge to edge bite is probably due to causes similar to those which produce the preceding abnormality.

"(3) Lack of anterior occlusion, or open bite may be caused in several ways—by thumb, finger, lip or tongue sucking, or may be due to want of development of the ascending ramus, and it might, in some instances, be due to a partial arrest of development of the intermaxillary bone.

"(d) *Abnormalities in structure.*—Additional cusps and variations in the number of the roots are more rarely found in the temporary than the permanent dentition.

ABNORMALITIES OF THE PERMANENT TEETH

"Abnormalities of the permanent teeth can be divided into those of (1) Size; (2) Number; (3) Position; (4) Structure.

(1) ABNORMALITIES IN SIZE

"There is no standard by which we can compare the relative sizes of teeth. It is possible to have the whole series composed of teeth of an abnor-

mally large or small character. The upper central teeth are most frequently developed to an abnormally large size, but it should be differentiated from a central that has become geminated with a supernumerary lateral incisor. The second lower bicuspid is also frequently abnormally large, approaching somewhat in character to the molar. The second lower molar is also occasionally affected in the same way. The lateral incisors in the upper, on the other hand, are often diminutive and modified in their shape, and in extreme cases are little more than simple cones; occasionally, however, they may be abnormally large. The upper third molar, like the lateral, is often dwarfed and modified in its shape.

(2) ABNORMALITIES IN NUMBER

"Variations from the normal number of teeth may be classified—(a) Excess in number; (b) Deficiency in number.

"(a) *Excess in number.*—Any tooth in addition to the normal number is known as a supernumerary tooth. They may be divided into two distinct groups—first, those resembling normal teeth in shape and character (called by some authors supplemental); second, those abnormal in form.

(3) ABNORMALITIES IN POSITION

"This section of abnormalities brings us to perhaps one of the most difficult subjects that comes under the care of the dental surgeon. The vagaries of nature are so frequent, and the accidental causes that may give rise to various forms of irregularities so numerous, that it is impossible in a manual of dental surgery, where only a few pages can be devoted to the subject, to treat exhaustively of all the manifestations and varieties which occur. It is proposed, therefore, to deal rather with those that are more commonly met with in practice, and to consider them on general principles.

"The causes giving rise to abnormalities in position may be divided into general and local.

"*General Causes.—Heredity, and Neurotic Tendencies.*

"*Local Causes.—Undue Persistence of the Temporary Teeth, Too Early Extraction of the Deciduous Teeth, the Extraction of the First Permanent Molar, Supernumerary Teeth, Thumb, Lip, Tongue, and Toe Sucking, Alveolar Abscess, Mouth Breathing, Cicatrices, the result of injury, especially after burns, lead in some cases to serious deformities. Hypertrophy of the Gums, Exostoses of the Bones, and other Tumors, such as the various Epulides, etc., also act as a local cause of irregularity.*

"*Classification.*—It is not possible to give any general classification of irregularities which will include every variety met with, but for convenience the following will be found useful and practical in considering the subject:

"(1) Irregularity in the position of individual teeth.

"(2) General crowding. This condition is often seen when bicuspids and molars are in good position, and may be produced by the following causes:

"(a) Too early extraction of temporary teeth.

"(b) Arrest in the development of the maxilla.

"(c) Excessive development in size.

"(d) Excessive development in number (presence of supernumerary teeth).

"(e) Eruption of wisdom teeth.

"(3) Contracted arch (a) The U-shaped arch; (b) the V-shaped arch; (c) the saddle-shaped arch.

"(4) Anterior protrusion of the upper teeth.

"(5) Protrusion of the lower teeth, 'Underhung bite,' 'Edge to edge bite.'

"(6) Nonocclusion of front teeth. Lack of anterior occlusion, 'Open bite.'

"Before proceeding to deal with the above classification in detail, it will be advisable to consider some general principles that should guide the dental surgeon in dealing with these cases.

(4) ABNORMALITIES IN FORM

"Among abnormal teeth are included all alterations in form, shape, or structure which have resulted from acquired, congenital, or heredity causes. They will be considered under the following heads:

"(1) Alterations produced by constitutional disturbances—(A) syphilis; (B) rachitis; (C) exanthemata; (D) disturbances of nutrition; (E) use of mercury; (F) gout.

"(2) Alteration produced by local disturbances.

"(3) Gemination.

"(4) Dilaceration.

"(5) Enamel nodules.

"(6) Abnormalities in the number of cusps."

Louis Jack (1832-1914). In the July issue of the *International Dental Journal*, 1893, *Aligning the Teeth*, he says he has used the following appliance for several years with great satisfaction.

"In reference to the alignment of teeth, carrying them in when they are too far out and bringing them out when they are too far in, he uses this plate almost invariably. It is composed of two pieces of vulcanite joined by a band of gold. (Fig. 1.)

"The posterior teeth are made the base of resistance by covering the second bicuspid and the molars of both sides by two separate shoes of vulcanite, which extend at either side of the teeth but a few lines beyond the margin of the gum. To give these shoes strength and to enable the patients to masticate upon them, they are surfaced with gold swaged to the form of the ends of the teeth. These gold facings are vulcanized to the shoes in their proper places.

"Some preliminary preparation of the cast is required to enable these shoes to hold firmly their position. They should go on with a little springiness. The cast is trimmed with a suitable instrument to take a shaving from the teeth at the neck, and also a shallow groove should in most instances be made in the plaster, at the gingival margin. The proper amount of cutting is quickly gained by experience.

"These bases of support for the movement of the teeth are connected by a narrow band of springy gold, one end of the bar being secured to one of the shoes, the other end being attached to the opposite shoe by a male screw fitting in a screw-cut tube or, with proper precautions, vulcanized into a projection on the outer plate of the shoe.

"The reason for this plan is that by turning the free end of the appliance the bar may be reduced or increased in length. If in any given arch a tooth or more is projecting and others are depressed, the bar is brought into contact with the most prominent tooth, and a piece of elastic rubber is placed between this point of contact; at the same time a rubber ring is carried over each of the teeth which are within the arch and is drawn through a hole opposite the tooth and extended to a button. On the next day the bar is screwed up enough to be again in contact, when a new pressure may be made or the tooth is rested, as the conditions require. If the depressed teeth are sore, they may be rested by tying through the same channel as the ring has passed. Remove these plates daily, each time making a gain in the progress. It is im-

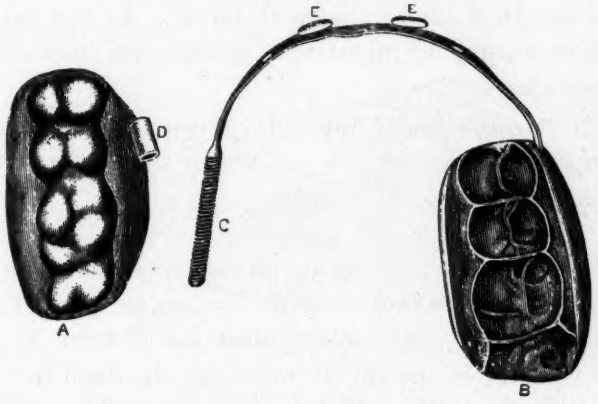


Fig. 1.

portant to make this daily change for the sake of cleanliness, the patient brushing the teeth while the further preparations are being made.

"As before intimated, all the front teeth may be moved at the same time either outward or inward.

"Rotation may also be conducted by the various attachments made for that purpose by connecting the rubber band to the attachment, and many modifications of this simple description will occur to meet the exigencies connected with the alignment of the teeth.

"It is also needless to state that the impression of the teeth should be taken with plaster.

"This method may be made useful in the treatment of cases at a distance whenever either of the parents of the child has the intelligence to comprehend the mode of operation of the plate and is capable of applying the required instruction. In this connection he has conducted the correction of a great protrusion of the upper teeth and concurrent depression of the lower arch for a patient living a thousand miles from me, the mother each day making the necessary changes of the plate or ligature. The upper teeth were forced

backward in the manner described, and when their position was corrected, a similar plate was placed on the lower teeth, when they were gradually brought outward into correct relation with the upper arch. This necessitated but three periods of attention on my part.

"The only originality in connection with this appliance is the division of the old form of upper plate which was used to separate interlocked arches and to connect these by the screw at one end of the bar. He presents this method as comprising many advantages for the purpose for which it is intended, and in this purpose is included the greater number of irregularities we have to treat."

Francis Jean in the June *Odontologie* and January *Revue Internationale D'odontologie*, Paris, January, 1893, states:

APPARATUS TO ENLARGE THE ARCH

"It is an ingenious plate, constructed as follows: Two metallic square rods of one millimeter and a half thick are placed in a parallel direction, each penetrating in a sheath made of the same metal. At the extremity, enclosed in the rubber plate, a piece of metal wire is soldered to each sheath, so as to hold it firm in the plate.

"This little apparatus, when finished, represents, when the plate has been divided in two in the median line, a rod and a sheath fixed each side on the palatine surface.

"The point at which this rod and sheath are to be placed is chosen according to the direction in which the displacement of the arch is to take place. If one wishes to act on the whole palatine surface, or roof of the mouth, from the central incisors to the last molars must be covered by the plate. The extremity of one rod and of one sheath must then be fixed in the center of each half of the plate in wax, and a line drawn in the direction which is to be followed by the saw, in dividing the plate when vulcanized. Now the important part is the mode of action of the plate, which is to separate gradually and mathematically the lateral parts of the apparatus, and to maintain them in that position.

"To do this, the two halves of the plate must be separated one from the other, and a platinum wire of half a millimeter thick is placed around the part of the rod where it comes out of the rubber. This will prevent, when the two halves will be joined together again, the rod penetrating to its full extent into the sheath, so that the two halves of the plate will be separated by a space equal to the thickness of the wire. Every three or four days another turn of a wire is added, and the separation of the plate will be so much increased. This is continued until the desired effect is obtained.

"If only a few teeth, say the bicuspid, are to be pushed out, the plate can be made much smaller, and only large enough to press upon these particular teeth. If to correct the deformity, in addition to the expansion of the arch, one desires to obtain a pressing backwards of the anterior teeth or incisors, a very narrow metallic band is passed in front of these last, the extremities of which band are fixed in the cheek side of the apparatus on a level with the

bicuspids. In this case the crown of the back teeth is to be covered with rubber, so as to be able to fix the band on the outside."

Safford Goodwin Perry, (1844-1911) in speaking of *Aligning the Teeth, International Dental Journal,* July, 1893, states:

"Cap the bicuspids, and sometimes the first molars, with a simple rubber plate, which is made with a little ridge rising over the bicuspids. Through this ridge a very small hole is drilled and countersunk on the distal side, and then the thinnest saw procurable is passed through the rubber into this hole. A knot is then tied at each end of a very thin piece of elastic, such as is used in place of wrapping-twine for boxes, parcels, paper, etc., and the ends slipped through the cuts into the holes. The knots drop into the countersunk ends of the holes, and so are safe from the danger of chafing the overlying lips. The pressure is varied, of course, by tying the knots closer together or farther apart, as the case may be. When the plate is in place, the elastic is drawn over the front teeth, and if care is taken in drilling the holes in the ridge on the plate at just the right place, the elastic will not ride up against the gum or slip off from the front teeth. This device is the closest fitting and the most comfortably worn of any I have ever used."

Fig. 2.

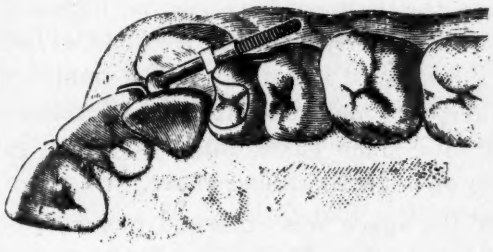


Fig. 3.

Norman S. Essig, in speaking of *A Regulating Case Involving Correction of the Position of the Median Line of the Arch, Dental Cosmos,* June, 1893, states:

"This case, which was that of a boy of fourteen years of age, presents some interesting features. First, as will be seen, the cuspid was completely out of the arch, the lateral incisor and bicuspid being in contact. Secondly, the central teeth were so much to the right of the median line as to constitute a deformity.

"The two objects to be accomplished, therefore, were to correct the center line and bring the cuspid into its proper position in the dental arch. To accomplish this it was necessary to take out the first bicuspid on the opposite side of the mouth, thus leaving a space which, if the median line were moved to its normal position usually occupied by the lateral incisor. After the bicuspid on the right side of the mouth was extracted, an impression was carefully taken, and the model or cast thoroughly dried and well soaked with sandarac varnish. An excavator was then passed around the teeth, cutting away the plaster representing the gum margin, so as to allow the caps to extend a little under the free margin of the gum when the piece was put in the mouth. After this was done, the caps were made for the bicuspid and the lateral incisor, as

shown in Fig. 2. These were made of twenty-two-carat gold, of about No. 30 thickness, and fitted snugly to the plaster, and in the case of the bicuspid the gold was carried up and just a little over the cusps, as shown in Fig. 3.

"The cap for the lateral incisor was provided with a socket on the labial surface, into which the bar was fitted, allowing of some movement while the teeth were being pushed toward the median line. This cap was also provided with a small arm or lug, which bore against the adjoining tooth in such a manner as to prevent the capped tooth from being pushed out of line while the space between them was being enlarged, and insure the movement of all the teeth bodily toward the left. The nut, which was given one or two turns each day by means of a small wrench, was placed next to the cap on the bicuspid, which was provided with a cylindrical attachment through which the screw passed. The pressure caused by the tightening of the nut lengthened the screw, and thus widened the space for the reception of the cuspid.

"A suitable wrench may be made from a discarded excavator; of course it is understood that no thread is needed inside the cylindrical attachment on the bicuspid cap, as it is desired that the screw as it is passed through should be free to respond to the pressure of the nut. The cuspid came down into place as the distance between the bicuspid and the lateral was widened, and when it was fully erupted a collar of gold was made which fitted up closely to the neck of the tooth, and a small loop of gold was soldered to the labial surface, to which was attached a rubber ligature, which helped to draw the cuspid into place more quickly. The ligature was attached to a little gold button on a small rubber plate.

"After the space was enlarged to receive the cuspid it moved very rapidly, and in its downward course came in contact with the bar or screw, which was then removed and a curved one substituted, which allowed the cuspid to pass inside, thus allowing it to continue on downward into the space prepared for it. The most remarkable feature of this operation was the quickness with which all the teeth responded to the pressure as soon as the force was brought to bear on the lateral incisor. When the median line was brought to its normal position and the teeth on their proper place, the fixture was allowed to remain as a retaining piece for about three months.

"This case was finished about two years ago, and since that time there has been absolutely no change in the position of the teeth, and their regularity is one of the noticeable features of the mouth."

In the April *Cosmos,* he says, *Moving Cuspids:*

"The case selected to illustrate the efficiency of the screw in moving irregular teeth is a cuspid that was not only greatly out of its normal place in the arch, but much turned upon its axis. Here it was necessary to draw it back so that it might be made to assume its place between the lateral and second bicuspid, and at the same time to turn upon its axis. This was accomplished by hooking the bar into a staple soldered well around on that part of the cap covering the labial surface of the tooth.

"An excavator was passed around the molar at that position on the model representing the free margin of the gum, cutting away the plaster from

around the neck of the tooth, exposing what would correspond to that portion of the tooth or root just above the enamel.

"No. 30 gold, about twenty-two carat, is used and burnished down, forming a cap which fits the tooth perfectly, following the line where the excavator has cut away the plaster.

"If such a band is to be placed upon on incisor or lateral, the face of the cap may be cut out, thus avoiding too much of a display of gold. Thin platinum may also be used, about the thickness of writing paper, and pure gold flowed over the surface after the piece is invested, but it is rather difficult to get the gold evenly distributed over the platinum.

"The first molar, on account of its being provided with three roots, is usually the best tooth to select for the point of resistance, for being reinforced by the bicuspids, it makes it pretty certain that it will not move when the screw is in operation.

"The gold is brought just over the edges of the cusps, and burnished to conform to the contour of the crown; the bar is then put in position, and the loop or rings by which it is attached to the caps, cemented on with hard wax. It is then invested in sand or marble-dust and plaster, and the rings soldered on.

"In making the caps it is better to have them a little loose, as the oxyphosphate with which the piece is cemented in will fill up between the gap and tooth, thus preventing moisture from creeping in under the gold.

"Platinized gold should be used for the bar, as the thread is not so likely to strip, and it can be made of thinner wire.

"When the piece is finished we have a fixture which will exert a force in a given direction sufficiently strong to move any tooth in the mouth; and while the force is not a persistent one it is positive and certain, and unaccompanied by any inflammation or soreness.

"Some members of the profession, who saw this piece before it was put in the mouth, expressed the opinion that the molar to which the fixture was fastened as a point of resistance, and also the bicuspid, would move before the cuspid did. The result showed, however, that this was not the case. The cuspid was not only brought back, but turned on its axis."

B. H. Catching, (1848-99) *Regulating Appliances, Catching's Compendium of Practical Dentistry,* page 191.

"This represents cases frequently seen, including superior lateral incisors. The cut is of the teeth of a robust young man, strong and firmly planted in the jaw. Without extraction the appliance moved the adjoining teeth laterally and brought the malposed tooth into position in two weeks. The same appliance was used as a retainer. No plate or caps were used to separate the jaws so as to allow the malposed tooth and its antagonist to pass. The patient operated the appliance by using a wrench, and had instructions to tighten the screw to his bearing capacity just before retiring at night. In this way, when the cutting edges of the opposing teeth came together, the upper was easily thrown outside the lower.

"Material used, German silver wire, solid and hollow. A thin band is made

to pass behind the malposed lateral and between the two adjoining teeth; to the end of this, resting on the cuspid, as shown in cut, a piece of hollow wire is soldered, in which threads are cut to accommodate the screw; on the other end, resting on the central incisor, a piece of hollow wire, with the outer end closed, is soldered; this acted as a socket into which the end of the screw without threads entered. A piece of hollow wire, as shown right over the malposed tooth, is soldered to the screw bar and filed square, so as to engage the wrench. When the screw became exhausted, the band under the malposed tooth was cut, lapped and soldered."

R. Ottolengui, Dental Cosmos, November, 1893, before the *New Jersey Dental Society,* read the following:

"Ever since I first entered upon the practice of dentistry, I have heard, ever and anon, the cry go up against the rapid regulation of teeth. 'Move teeth slowly, and avoid the danger of destroying the vitality of a pulp,' has been the warning. By some, and I believe by many, this danger to the pulp has been claimed to be greatest when torsion of a tooth is the movement attempted. It is this idea I shall endeavor to disprove.

"The death of a pulp is probably caused, when it occurs during regulation of teeth, by the production of a pericementitis in the vicinity of the foramen, which impairs the nutrient supply of the pulp, which in turn results in inflammation of pulpitis, followed by its death. The pericementitis is occasioned by a pressure in one direction, which causes an absorption of the impeding tissues more rapid than the progress of repair of the tissues f. om which the tooth is receding. The idea of rapidity, as affecting this result, can have but one connection with this process, and that is as it applies to the distance to which the tooth is moved. This is evident, for the shorter the distance through which the tooth is moved, the less can one logically complain of the rapidity with which the tooth is moved, the less can one logically complain of the rapidity with which it is accomplished. For example, a tooth is moved when a silk is pressed between two contiguous teeth, yet it would be folly to claim that to pass a silk rapidly would be more dangerous than to do it slowly. I cite so extreme a case to reduce the proposition to the ridiculous, the *reductio ad absurdum* method of mathematics.

"Hence it follows that it is dangerous to move teeth rapidly only when they are to be moved a considerable distance. Before passing from this, I will say, parenthetically, that the foregoing is not the only way by which a tooth-pulp may be made to die during the regulation of teeth, but it is probably the explanation of devitalization resulting from the too rapid movement of teeth, which is the subject under consideration.

"If it be true that the danger of rapid movement is in proportion to the amount of movement, I have but to show that in the act of torsion a tooth is but slightly moved, in order to support my theory that teeth may be twisted rapidly with little if any danger. And when it is remembered, as it should ever be, that any regulation of the teeth which covers a long period of time becomes a distinct strain upon the nervous system of the child, one sees at a glance that, where it can be done safely, the most rapid movement of teeth is the best and only method which should be adopted.

"It is my intention to show you a typical example of the several conditions wherein torsion is required, and to point out the amount and direction of the movement. But first I will call your attention to my methods.

"It is well known that to rotate a tooth in its socket, it is necessary, in some way, to produce a pressure which will act upon one corner in one direction, or else upon both corners in opposite directions. Numerous devices for this purpose have been employed.

"My method is to band the teeth with gold, having one or more hooks upon the band, as may be required for the individual case. This band is made very easily. I use pure gold plate of 28 gauge. Having cut a strip as narrow as possible for my purpose, I bent it approximately to shape with the ends turned up at right angles. This loose open band is slipped over the tooth, and not carried much beyond the cutting-edge. The ends are then caught with the serrated beaks of a pair of pliers, and drawn tightly together, which produces a tight-fitting band, except that as the palatal surface of the central incisor is concave, the band will pass straight across that surface, leaving a space. Later, however, when the band is set with cement, and pressed farther up, so that it impinges upon the bulbous part of the tooth, it becomes more accurately adapted; the loose ends are united with a tiny bit of solder, and then turned down to form the hook. When I need two hooks, I begin with two strips soldered together, and when the loose ends are united, I bend extensions to form my two hooks. The bands are cemented to the teeth, and so are permanently fixed until the rotation is completed. With a central incisor banded in this fashion, if a rubber ligature be thrown over the hook at the anterior labial corner, carried backward and attached to some fixture within the mouth, the anterior corner of the tooth will be carried in. If, however, the ligature attached to the same hook be carried around the palatal side of the tooth, and outward around the posterior corner, to be attached to a fixture outside of the arch, the result will be a rotation which will carry the anterior corner inward and the posterior corner outward at the same time. A similar result obtains when the ligature is hooked on the posterior palatal hook, then carried around the labial surface and inward around the anterior corner, to be attached to a hook within the mouth. The selection of either of these methods would depend upon the class of fixture used, that is, whether there be an external band or not. Next, the posterior corner alone may be affected, by carrying the ligature from the posterior palatal hook outward to a band, carrying the corner out by its action.

"The cuspid is probably the most difficult tooth to twist, yet it can be accomplished. I make a gold cap for this tooth, upon which I have my hooks for attachment of rubbers. This cap, like the band for the centrals or laterals, is made at the chair, without recourse to dies or models. I cut my gold into a shape similar to an hour-glass. When doubled by bending across its shortest diameter, we already have an approximate cap. This is slipped over the tooth, and burnished to it, after which the open edges are soldered together. An accurately fitting cap can be made in this manner in a few minutes without going to the laboratory. The hooks are formed of a round wire, the ends being pelted to form knobs, and then soldered across the cap. This allows all

the variation of attachment of ligatures and direction of rotation described in connection with the incisors.

"I pass now to the consideration of specific conditions. I may say that all forms of irregularity may be classified as belonging to three groups. First, where the anterior corner alone must be moved; second, where the posterior corner only needs change; and third, where both corners are in abnormal position."

Dr. Ottolengui further explained his method and appliances for regulating teeth, and illustrated, by means of movable diagrams, the gradual movement of the teeth in the operation of regulating. These explanatory remarks would be but imperfectly understood in the absence of the diagrams, and are therefore omitted.

Dr. C. L. Boyd, (*Ohio Dental Journal,* July, 1894) states:

"The writer takes the position that lack of development of the maxillae is the first potent factor in crowded condition of the teeth. He says a system of mouth massage will accomplish much in enlarging the arches, and suggests that mothers and nurses be instructed in gentle and persistent rubbing of the inside of the infantile jaws."

Dr. H. E. Cutter, (*International Dental Journal,* June, 1894) on *Drawing the Lower Jaw Forward,* states:

"The patient was a girl eleven years of age. The upper arch was narrow and pointed, with the front teeth very prominent. The lower arch was regular, but the front teeth were elongated in comparison with the bicuspids, so that their cutting-edges almost touched the gum behind the upper incisors. The upper centrals projected fully a quarter of an inch beyond the lower teeth. The upper and lower cuspids, however, almost touched each other. When the mouth was at rest, the lips did not cover the front teeth, so that the face had an unpleasant expression. The profile was even more uncomely, for, besides the projecting teeth, the chin was receding, and seriously marred what would otherwise have been a fine face.

"It is important to make a careful study of the general outline of a patient's face, as well as of the teeth, before beginning any corrective treatment. And we should take into consideration the teeth and facial expression of the parents of the patient, in order that we may know what is likely to be the natural development in the child. If this were more frequently done, we should have more satisfactory results. By recognizing a family tendency to a deformity at an early age, a simple method can often be successfully employed to prevent its development. Another patient might have a set of teeth very similar to the one before us, and yet an entirely different treatment is required. In the one case the deformity might be due to a receding lower jaw, but in the other to a projecting upper jaw. The first and most important question in cases of this kind is to decide at the outset whether it is the upper or lower jaw which requires treatment, for upon this success or failure largely depends.

"Before undertaking a case of this character, one should first satisfy himself that the patient is one who will willingly undergo some unpleasant requirements. For there is occasionally a person who is very anxious to

undergo treatment, and for a time he faithfully follows the instructions given; but gradually he becomes indifferent and careless, and the treatment of the patient has to be abandoned.

"In the case before us it was evident that the lower jaw could not be carried forward without first expanding the upper arch. This was done by means of a thin rubber plate, into which was vulcanized a German silver jack-screw. To hold the width which was thus gained, and at the same time to flatten the arch, another plate was made. A spring German silver wire was bent around close to the outside of the teeth, with its ends embedded in the plate at the sides. From time to time the wire was bent so as to bear hard on the mesial edges of the centrals, and thus the arch was gradually flattened.

"This being done, the next step was a more difficult one, which was to lengthen the bite and at the same time draw the lower jaw forward.

"This plate was made thick over the bicuspids and the first molars and behind the front teeth. Deep depressions were made in the plate a little forward of the places where the cusps of the lower teeth would naturally touch the plate. The result was that the patient began to carry the lower jaw forward a little, so that the teeth would enter these depressions.

"It was found, however, that a plate which covered the bicuspids and first molars prevented these teeth, both in the upper and lower jaws, from elongating and forming a new articulation to correspond with the lengthened bite. Therefore another plate was made for the upper arch. This one was thickened only behind the front teeth, where depressions were made to receive the points of the lower incisors. No other teeth of the lower jaw were allowed to touch any part of the plate. This plate was held firmly in place by wire clasps encircling the first molars. There was also attached to this plate a wire which passed around the outside of the front teeth to keep them in the flattened position which they had assumed.

"In making this plate much care was required to have the depressions in just the right places, and of exactly the proper depth.

"A wax and paraffin base-plate was fitted to the plaster model of the upper arch. To the part where the plate was to be thickened soft yellow wax was then added. While the wax was soft the base-plate was inserted in the mouth, and the patient told to throw the lower jaw forward and bite into the wax, thus determining how much the jaw was then to be carried forward and the bite lengthened. This was an important question, for a slight variation at this point might have produced an unfortunate result. Several plates of this character were made, as the amount to be gained had to be gradually accomplished.

"When the case was begun but one second molar had begun to appear; when the work was completed, all four of these molars had erupted and interlocked with each other. The result was that the patient could comfortably bring her jaws together only as they had been newly related.

"All that then remained was for the bicuspids and first molars to complete their articulation, which they are doing.

"It was necessary to carry the lower jaw forward while the second molars were erupting, as the retaining of the jaw in the new position depended en-

tirely on the articulating of these teeth. Unless the operation had been undertaken at just this time, it is doubtful if it could have been accomplished. It would not have been possible to secure the retaining of the jaws in the relation they now are had the attempt been made at an earlier or a later time.

Dr. T. F. Chupein, (*Dental Office and Laboratory,* July, 1894), *Attaching Regulating Appliances.*

"Sometimes, in making a vulcanite crib or covering over the bicuspids and molars to be used as a buttress or point of resistance for the jack-screw to press against, this crib drops off or loosens, thus defeating the object. We have found that they may be made to hold securely by lining the entire surface with moderately thin oxyphosphate cements, wiping the tooth dry and forcing the crib in place. After it has set hard the pressure on the jack-screw may be applied with no fear of its coming off or getting loose."

DRAWING DOWN AN UPPER CENTRAL

In the case of Drawing Down an Upper Central he reported a case of a superior central incisor broken off, but left long enough to be brought down in regular order with the other teeth.

"A cap of gold was made to fit the broken tooth. For the two adjoining teeth, saddle caps were made. A bar extending from one to the other of these caps was soldered to the ends of them, a hole was drilled in it over the end of the fractured tooth, to admit a screw post, which was adjusted and soldered to the cap of the fractured tooth. The appliance was set with cement, and a tap was placed on the screw post, which, on being turned, tracted the short tooth. The elongation was accomplished in about five days. As a retainer, thin caps were made for the three teeth; to them was soldered a bar on the labial surfaces; these were cemented in position."

Again in the September number of the same Journal we find in speaking of *Protrusion of the Upper Teeth Regulated:*

"Deformities of this kind produce a great disfigurement of the countenance, and when unsightliness is rectified so as to produce a harmony, the aid of all parents should be enlisted in the work.

"A correct impression of the upper and lower teeth is taken, with modeling compound, to serve as a history of the case, and the two models made from these are placed together to show the natural articulation. A plaster of paris impression is taken of the two central incisors, and after the sides of this are luted, crown, or low melting fusible metal, is poured into this impression. This gives a correct die of the front teeth, over which a gold cap may be accurately fitted, by burnishing pure gold of No. 30 or 32 gauge, to it, after having first made a thin lead pattern of the cap.

"The cap made, two little hooks or headed platinum pins, such as may be made by breaking an old vulcanite tooth and using the pins from it, are soldered to it on each distolabial edge.

"We next proceed to bend, in the mouth, around the first molars, two thin German silver bands. This is done by passing the metal, which should be about one-eighth of an inch wide, around these teeth, and drawing it tightly

against the tooth by seizing the ends with a pair of flat-nose pliers. The band thus formed is carefully removed from the tooth and heated red hot while held by the pliers. By doing this, when the pliers release their hold of the ends of the band, the metal being changed by the heat, will not spring away, and they can then be accurately soldered together. The band thus formed may be placed on a wooden stick or tapering mandril, and the ends which have been soldered may be filed, or the soldered ends may be bent backward so as to form a hook.

"These preliminaries accomplished, the cap is cemented to the two front teeth with phosphate cement, and the bands also cemented to the molar teeth. It may be a valuable precaution regarding these molar bands to solder a small tick, at some suitable point, to them, and when they are cemented to the teeth to bend the tick over the masticating surface to prevent the band working up to the neck of the teeth, burying itself in this tissue, and causing intolerable pain.

"The bands and caps being adjusted, as shown in Fig. 4, elastic bands

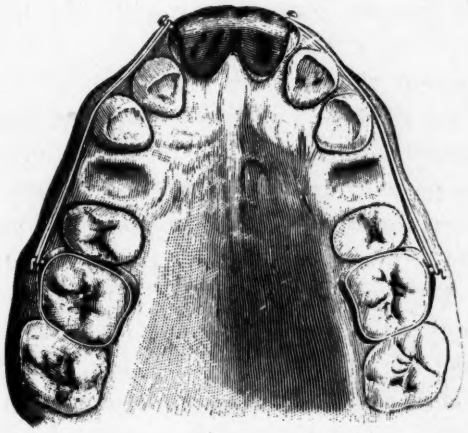


Fig. 4.

are hooked over the pins or hooks of the cap and stretched back and hooked over the molar bands.

"We omitted to say that in order to obtain room for the backward traction of these teeth, the first bicuspids were extracted.

"It might be found that the elastic bands, after having been worn a week, lose their strength or elasticity, in which case they should be changed weekly or oftener. The progress is slow, but as the appliances give little discomfort, is therefore no impediment to mastication, or to the proper cleansing or brushing of the teeth; the time consumed is not of much moment.

"Should the elastic bands slip down and bury themselves into the gum, this may be rectified by placing a little hook over the eye-teeth, which will lift it from the gum, and hold it in position by the resilience of the rubber. Such a hook is formed of a piece of plate, snipped by the shears so as to make two ends on one side, and a single end on the other; to the single end the hook is bent, while the two extensions are pressed over, in order to let the point of the eye-tooth protrude."

Grant Mitchell (*Ohio Dental Journal,* February, 1895), *Enameling Retaining Appliance:*

"After the teeth have been regulated, making the retaining bands of platinum plate of suitable gauge, solder with pure gold, coat the labial surface with properly shaded enamel, and bake."

George Cunningham, (*Dental Record,* London, 1895), *Luxation or the Immediate Method of Treating Irregular Teeth.*

"Many interesting cases treated by the author after this manner are illustrated. His *modus operandi* is as follows:

"All the teeth should be thoroughly scaled, cavities filled, and an alcoholic saccharin wash used several times a day before operation.

"On the day of operation. Brushing the teeth and bathing them with saccharin wash—better with H_2O_2 than H_2O for dilution—same wash after the operation and frequently next few days.

"It is well, except in the simplest cases, to have studied a model, making the rearrangement of the teeth on a duplicate model. If a splint can be prepared from this ready for use immediately after the operation, so much the better.

"All being ready, cut the alveolus with a thin circular saw, ⅞ inch to 1¼ inch in diameter, not thicker than thin note paper, into such sections as are necessary. This is quickly done, and can be borne quite frequently without any anesthetic. Forceps, elevator, or other instrument is used for pushing, pulling, or rotating the tooth sections into place. Forceps should have the beaks guarded. I use copper sheaths molded and soldered so as to fit the beaks fairly tightly. Rubber sheaths, soft or hard, will also do. Dr. Bryan's special forceps with curved support for bringing a tooth inside the arch into line seems well adapted for this purpose. Moving teeth backward or rotating teeth out of line into the arch is much facilitated when a badly carious neighboring tooth is extracted. This extraction may be done at the time, but possibly better two days or so previously, as the local postoperative inflammation facilitates the bending and movements of the alveolus. In such cases the sectionizing of the tooth and its alveolus may be done with a pair of surgical bone cutters, or even with Physick forceps. The wedge-shaped beaks of the latter are extremely useful when it is necessary to push the teeth backwards. The movement of the tooth or teeth into the desired position may be very easy, but often requires great strength carefully applied. One to six teeth have been so moved. The chief point in the operation is to move each tooth with its socket entire as far as that may be possible.

"The teeth when in position should be ligated with silk or thin silvered steel wire, preferably the latter, or fixed in a splint. Thin German silver or platinum bands soldered together make a good splint.

"Care must be taken in closing the teeth, as the articulation is almost certain to require adjustment by disking, etc. Carborundum wheels work quickest.

"When finished, syringe thoroughly with peroxide, saccharin wash, especially any pockets or spaces marking the previous position of the moved teeth.

Paint all the bleeding or cut surfaces with Richardson's styptic colloid. To a saturated solution of tannic acid in alcohol and ether (equal parts) pyroxylin (gun-cotton) is added, as the liquid will dissolve (tannin collodion preparation). The pain has usually subsided by this time and the patient feels fairly comfortable. The patient should be seen next day in case the teeth have moved —syringing, styptic and cleansing, as before. If possible, continue this treatment for the next few days, the patient always using the wash after meals. In a few cases new ligatures may be unnecessary; ligatures should be renewed or dispensed with as required by the indications. A period of three or four weeks is usually ample time for retention by ligatures or splints."

DEPARTMENT OF
ORAL SURGERY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

M. N. Federspiel, D.D.S., M.D., F.A.C.S., Milwaukee.—Vilray P. Blair, M.D., F.A.C.S., St. Louis, Mo.—William Carr, A.M., M.D., D.D.S., New York.—Joseph D. Eby, D.D.S., New York. — Leroy M. S. Miner, M.D., D.M.D., Boston.—Wm. L. Shearer, M.D., D.D.S., Omaha.—Fredrick F. Molt, D.D.S., Chicago.—Robert H. Ivy, M.D., D.D.S., Philadelphia

THE SIZE OF THE INFANTILE PALATE*

By B. S. Denzer, M.D., New York City†

ONE of the lessons of the Great War that we shall probably forget, as we have forgotten other lessons, is the importance of the liaison officer. In principle the duties of this officer were to keep the various departments of the army in close touch with one another and so to co-ordinate their activities that they might reach a common goal with the least effort and friction. We can hardly expect that the medical and dental professions which have nearly a common goal, ever will be so organized that this fine degree of co-operation will be realized. This is particularly to be regretted because there are many problems that might be attacked best by the combined efforts of men working in very different specialties. It is as if each group were interested in tilling its own field and that the borderland fringe where one property merges into another is uncultivated. The subject about which I am to speak is on the fringe of my own special interest—pediatrics. Indeed it is possible that I have wandered too far afield and I may be in regions strange to me but quite familiar to you. If so, I am sure that I shall receive your kindly and not too critical guidance.

It may be worth while to trace the course of my interest in the infantile palate because it began as an intensely practical problem. From time to time I have been seeing children operated upon for the relief of nasal obstruction, whose lips could not possibly close because of misshapen jaws. In reading your texts on orthodontia for any explanation of the occurrence of these malocclusions, I unconsciously reclassified the theories as to causation into two practical groups—those theories that referred to causative factors beyond our control, congenital conditions and hereditary tendencies, and those that

*Read before the Annual Meeting of the New York Society of Orthodontists, New York City, April 12, 1922.

†Pediatric Service, The New York Nursery and Child's Hospital and the Department of Pediatrics, Cornell University Medical School.

referred to acquired conditions such as neglect and early removal of deciduous teeth, rickets, malnutrition, thumb sucking and particularly tonsils and adenoids. Is the latter group—the acquired conditions—a dominant factor in the cause of large numbers of cases of malocclusion and if so, how early in life do they distort the shape of the jaw and palate? The problem appealed to me as one of practical preventive therapy. If preventable conditions such as adenoids and rickets in infancy lay the foundation for malocclusion in later childhood, then prevention or cure of these conditions may obviate a number of cases of malocclusion. As many of the conditions mentioned occur during the first two years of life, infancy became the critical period for study.

The plan was to measure the palates of groups of infants with rickets, large adenoids with mouth-breathing, etc., and to compare these measurements with those of normal infants of the same age. The existence of a standard of the size and shape of the normal infant's palate was a prerequisite for carrying out this plan. To my surprise only one reference to the size of the living infant's palate could be found. I decided, therefore, first to fill this hiatus in our knowledge and measure a number of infantile palates. The comprehensive plan of studying the jaws of cases of rickets and other conditions has not been carried out and so many other interests and duties have arisen since the beginning of this work that I fear the final goal will not be reached by me. Nevertheless the preliminary work on the normal infant seems to be worth recording, first because it establishes a standard with which the abnormal may be compared, and second because it demonstrates a satisfactory method of measuring the infantile palate.

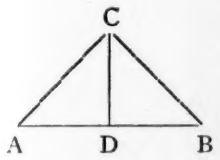


Fig. 1.—Alkan's method of measuring height of palate; *A-B*, width of palate; *A-C* and *B-C*, distance from alveolar margin to raphe; *C-D*, height of palate.

The only measurements of the infantile palate that could be found in the literature are those of Alkan, who examined the palates of thirty-six newborn infants. The method of mensuration used by Alkan seems rather crude and the criteria of the shape and size of the palate appear ill chosen. The width was obtained by placing the arms of a compass on the alveolar margins, removing the compass from the mouth and measuring the spread of the compass on the straight rule. "The width of the palate was measured in only one place, which corresponded to about the mid-point on the alveolar arch." Alkan himself referred to the greater accuracy of plaster casts; indeed it must be quite impossible to determine exactly the mid-point on a tiny infant's arch, even if the mechanical difficulties of manipulating infant and compass are overcome. Furthermore, the reasons are not clear for choosing this part of the alveolar arch. The mid-portion of the alveolar arch does not correspond to any fixed anatomic point (as does the position of the molars or the premolars in the second dentition), nor does it represent an absolute value, such as the greatest width or the greatest height. Alkan measured the height of the palate indirectly by constructing a triangle, measuring from either alveolar margin to the median raphe. Thus from the three sides of the triangle he calculated the height of the palate by measuring the line dropped

from the apex of the triangle (the raphe) to the base line (the width of the alveolar arch). (Fig. 1.) This technic involves the removal of the compass from the mouth in measuring each side of the angle. It is difficult to conceive how, in measuring the two sides of the triangle, one could find the same points on the alveolar margin and the raphe, a procedure which accurate mensuration demands.

When I presented the problem to my former chief, Dr. Schloss, and mentioned the difficulties of measuring the palate he advised me to seek out one of your number for assistance. The application of engineering methods to ortho-

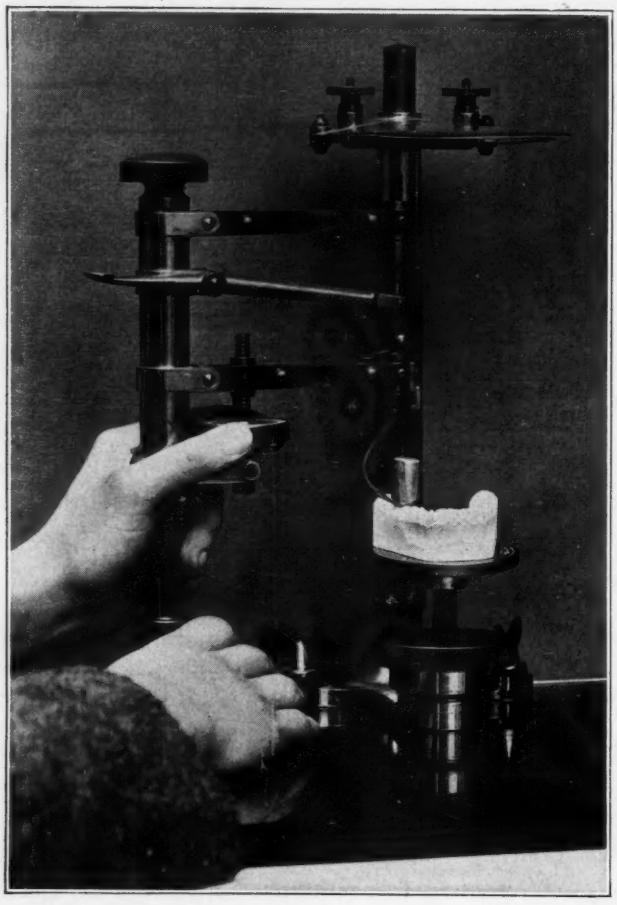


Fig. 2.—Surveying apparatus. (Stanton.)

dontic problems is so well known to you that it is unnecessary for me to enter into either the principle or the practice of this means of mensuration. With the assistance of Dr. Stanton and his associates I was able to obtain faithful impressions of the infantile palate, to pour stone casts and to submit them to accurate measurement with his surveying apparatus. This solved the problem of technic. (Fig. 2.)

Only the question of the criteria for judging the shape of the palate remained. The greatest width and the greatest height seemed to be the most significant measurements. The greatest height was chosen because the high

palate is one of the supposedly characteristic features associated with changes due to malocclusion and mouth-breathing in older children, and this measurement would serve as a basis for comparison. The greatest width was chosen rather than the width at any fixed distance from the frenum because there are (Fig. 3) no anatomic landmarks on the infant's jaw that bear any logical relationship to the height or the later development of the palate. Furthermore, the greatest width like the greatest height is an absolute and not a relative figure. It is customary for purposes of comparison to express the relationship of height to width by the index $\frac{\text{Height}}{\text{Width}} \times 100$, and this formula has been followed.

Thirty-nine children under 1 year of age were studied. Most of the cases were taken from the "feeding" service of the New York Nursery and Child's Hospital—a ward in which ill nourished infants, foundlings and infants awaiting adoption are cared for. Thus, although a few showed

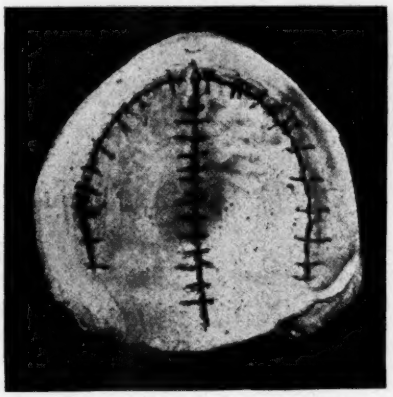


Fig. 3.—Dental stone cast of palate. The points surveyed have been made heavier to permit of photographic reproduction.

normal weights, most of the infants were under weight; many were mildly rachitic but none severely so.*

Table I gives the average for all the cases. The greatest width is 30.9 mm. and the greatest height, 8.79 mm. The $\frac{\text{Width}}{\text{Height}}$ index is 28. Table III indicates that the variations according to age fall within narrow limits. The average palate of the infant from 6 to 12 months of age is a little broader, but no higher than that of the one month old baby. The palate of the heavier child bears a similar relationship to that of the lighter (Table IV) but it is impossible to determine whether this difference is due to increasing age or weight.

It would be futile to compare these measurements with those of Alkan for reasons already indicated—the difference in technic and the fact that Alkan measured not the greatest width and the greatest height but the width and height at the mid-point of the alveolar arch. The normal $\frac{\text{Width}}{\text{Height}}$

*The group is as nearly normal as can be found in hospital practice.

TABLE I

AVERAGE DIMENSIONS OF PALATES OF CHILDREN UNDER 1 YEAR

Numbers Cases	Greater Width (Average), Mm.	Greater Height (Average), Mm.	$\frac{\text{Height}}{\text{Width}}$ index (Average)
39	30.9	8.79	28

TABLE II

DIMENSIONS OF PALATES OF ALL CHILDREN STUDIED

Age	Case Number	Weight	Greatest Width	Greatest Height	$\frac{\text{Height}}{\text{Width}}$ index
3 months	12	8 10/16	32.5	8.7	27
4 weeks	29	6 10/16	27.5	8	29
4 weeks	25	6	29	8	27
12 days	10	8 12/16	30	11.3	37
6 weeks	30	5 10/16	28.5	8	28
6 weeks	31	6	30	9.9	33
6 weeks	22	9 8/16	30.5	9.6	34
7 weeks	14	6 10/16	28	7.4	26
2 months	13	7	28	9.5	34
2 months	41	14	27	7.7	28
2 months	23	8 10/16	31	10.1	33
2 months	19	4 8/16	28.5	7.5	26
3 months	9	.....	32	7.4	33
3 months	12	8 10/16	32.5	8.7	27
4 months	8	11	33	9.7	29
4 months	16	12	32	9.4	29
4 months	21	9	30	8.7	29
4 months	7	11	34	9.5	28
4 months	3	10 2/16	32.5	10	31
5 months	43	9	32	8.2	26
5 months	44	10	30.5	10	33
5 months	4	9 8/16	30	8.6	28
5 months	5	12 8/16	28.5	9	32
6 months	34	9 6/16	31.5	9.6	30
6 months	36	11	30.5	8.6	28
6 months	35	7	28.5	7.2	26
7 months	15	8 6/16	31.5	7.7	24
7 months	6	9	30	8.7	29
7 months	33	10	32	8.1	29
8 months	42	17 12/16	33.5	8.3	25
8 months	45	9	31.5	9.9	25
9 months	28	17	35	8	34
9 months	38	14	32.5	7.1	23
10 months	37	19	36	9.3	23
11 months	26	12 10/16	30	9.5	26
11 months	40	17	34	9.4	28
11 months	39	13	33	8.1	25

index for adults according to Bloch falls between 44 and 58; that is to say the infant's palate is broad and flat and the adult's is comparatively high and narrow. Whether the measurements of the infantile palate have any significance in relation to the normal palates of older children or to the palates of children with malocclusion is a question that I am not competent to discuss.

If I may be permitted to pass judgment on my own work however, I should suggest that its significance lies not in the meagre results obtained but in that the same method of attack applied to those pathologic conditions

TABLE III

AVERAGE DIMENSIONS AT DIFFERENT AGES

Age	Number of Cases	Greatest Width (Average), Mm.	Greatest Height (Average), Mm.	Height / Width index (Average)
1 to 3 months, inclusive	13	29.4	8.7	28
4 to 6 months, inclusive	12	31	9	29
7 to 11 months, inclusive	11	32.6	8.5	26
	39*	30.9*	8.79*	28*

*Average dimensions in children under 1 year.

TABLE IV

AVERAGE PALATAL MEASUREMENTS OF CHILDREN CLASSIFIED ACCORDING TO WEIGHT

Weight	Number of Cases	Greatest Width (Average), Mm.	Greatest Height (Average), Mm.	Height / Width index
Under 10 pounds*	19	29.9	8.7	29
Ten pounds and over†	15	32.5	8.9	27

*Average age 3½ months.
†Average age 6⅞ months.

suspected of a relationship to malocclusion would yield data of great value. Let me cite an example of the kind of problem that such an investigation might solve. It has been stated by a well-known physician that failure to remove hypertrophied adenoids "before the sixth month leads to the development during the first year of the short upper lip, and the narrow high vault, which are associated with the adenoid face." I am not holding a brief either for or against that statement. However, I doubt very much whether it is possible to decide upon the narrowness or height of the infant's vault merely by glancing at the mouth. If it is true that hypertrophied adenoids lead to the development of the high vault before the end of the first year, then we are derelict in our duty in not removing all hypertrophied adenoids early in life. If it is not true, then the supposed high vault cannot be used as an excuse for adenoidectomy. The solution of the problem, something more than a mere expression of opinion, lies within our reach. The measurement of the palates of a series of infants with large adenoids and mouth-breathing and a comparison of the height-width index with the normal would be definitive.

The effect of other conditions on the shape of the jaw might be studied in similar fashion. It would be most interesting if the inmates of our large infants' and children's asylums could be investigated in this way. The changing shape of the jaw could be followed over a period of years in normal children and in those suffering from the conditions mentioned. Such data would afford most valuable proof of the rôle played by rickets, adenoids, bottle feeding and the like in the causation of malocclusion. I realize what a colossal task this would be, but it would be worth while. It would demand a close liaison between hospital administratives, orthodontists and physicians. It would mean quitting the center of your own field and cultivating with your neighbors the borderland fringe where the interests of both of you touch and fuse. It is a task worthy of cooperative effort.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., and Howard R. Raper, D.D.S.

ENCOURAGING THE USE OF THE X-RAY MACHINE BY THE INDIVIDUAL DENTIST*

By Dr. J. D. McAlpin, San Francisco, Calif.

THE subject which I have chosen is one to be considered from many angles. Although it is impossible for me to cover it thoroughly, I will endeavor to bring out a few thoughts for your consideration.

It is a fact well recognized that every dentist in the United States now realizes the value of the x-ray, and if called upon for his opinion he will say that the time has come when the use of the x-ray in dentistry is indispensable. It seems, however, that the principal question is how are we to obtain dental radiograms in the most efficient and economical way. Let us first consider the commercial x-ray laboratory as we now know it. For a few dentists located in the cities there are x-ray laboratories in the same building, perhaps on the same floor, other dentists send their patients out of the building and at times across the cities, while still other dentists in the small towns are compelled to send their patients into the cities to have their radiograms made.

In any of the above cases noted it is almost impossible to give a real efficient and scientific diagnosis as it is between twelve and twenty-four hours before the dentist receives the radiogram, unless the dentist is willing to depend upon the diagnosis of the radiographer, who at the present time I am sorry to say is usually a layman. The above is only one of the many inconveniences the dentist meets with in sending his work to an outside radiographer.

Now let us consider the dentist making the radiograms in his own office and its advantages. Why has not the average dentist an x-ray machine in his individual office? There are four principal reasons, any one of which will sufficiently answer this question. The first is, the expense of installing an x-ray machine, the second, the time consumed in making the radiograms,

*Read before The American Society of Dental Radiographers at Los Angeles, Cal., July 19, 1922.

the third, lack of floor space necessary to install the equipment, and fourth, the lack of knowledge of the technical work and interpretation of the radiograms.

I will read a short tabulation prepared by Dr. Henderson. This tabulation is a very concise and pointed answer to the first two reasons mentioned above. Dr. Henderson says in part that he is engaged in the practice of general dentistry in a small county seat and his report covers a period of twenty-five weeks. The report is tabulated, giving the number of minutes consumed in taking the number of radiograms and giving the financial returns for this work. The report begins October 5, and closes March 26. The total number of minutes consumed are 430, the total number of exposures made are 130, the financial returns are $258.50. Dr. Henderson has figured his investment on a basis of $725 at 7 per cent, which is $25.37. The cost of films is figured at $6. The salary of his nurse, at 50 cents an hour while she is actually engaged in handling the radiograms is figured at $7.58. The cost of dental mounts is $4.05. The cost of developing is given as $1.39, making a total expense of $44.30. This gives a net return of $214.20, and after computing on the per hour basis actually consumed in making and handling the radiograms, Dr. Henderson's income is $29.09 an hour.

Referring to the expense of installation, there are x-ray outfits on the market at the present time which sell for as low as $575 which are complete, and these outfits can be purchased on terms of $35.00 a month. I believe this completely covers the first two reasons.

For the third reason, the lack of floor space necessary to install the equipment. The x-ray outfit above mentioned covers an area of seventeen and one-half square inches, it is mounted on castors, is freely movable, and can be attached to any 110 volt, A.C. current, and is so constructed that when not in use the tube arm can be extended upwards and the seventeen and one-half inches above mentioned is all the space necessary to allow for the machine.

The fourth reason, lack of knowledge of radiographic work, and the interpretation of the radiograms is the most important subject to be considered at this time. The technic of operating the machine and developing and finishing the radiograms is very simple and can be learned in a very short time, after installing the machine.

I do not feel that it would be too broad a statement to make, to say that dental radiography is as indispensable as the practice of dental science today. It seems that we should have some definite technic of making and reading our pictures. Suppose, for instance, we classify our tissue in Classes 1, 2, 3, 4, and 5, Class 1 to be known as the cheek and gum tissue, Class 2 as the alveolar process, Class 3 as the root, Class 4 as the crown, Class 5 as the filling materials and metals.

We would then start to read the radiogram from the free margin of the film first which is the cheek, then the gum, etc. If we find that the free margin is not properly exposed or developed, we at once know that the picture is not going to give us the proper detail in any part, regardless

of the angle from which it was taken. This will I believe convince you that the average record kept of bone reconstruction is not accurate because of the possibility of burning out the detail or the lack of some technic of the first and subsequent pictures; for instance, most of those present have been called upon to read radiograms for others in the profession and at a glance you were able to detect the lack of development or the use of too hard a ray.

As an illustration, in a clinic last week, several of us were discussing radiographic check-up work and for demonstration we made a picture of an upper lateral which we knew to have a large area at the apex. This first picture was made at the proper angle with the proper back-up and gave us full detail. The apex was then amputated and all necrotic tissue curetted and immediately another picture was made with the back-up six inches and 35 milliamperes with just a slight elongation, therefore a great deal of the detail was burned out and the condition looked as though new bone had been built in. This is only one of the many cases which prove that it is necessary that each and every dentist should learn more of the real principles of radiography, and I believe the only way is to put in some of our time in learning to operate our own machine, thereby saving time for ourselves, and inconvenience and suffering for our patients.

DISCUSSION

Dr. Clarence O. Simpson.—It is easy to discuss Dr. McAlpin's paper because I disagree with most of the points presented. Had he said that the use of the x-ray was indispensable to the practice of dentistry, there would be no argument. What he said, every dentist in the United States realizes the value of the x-ray and considers it indispensable, he is charitable but more than half wrong. Perhaps the standard of practice in San Francisco is exceptionally high, but generally about 75 per cent of dentists either do not use the x-ray or only occasionally as a last resort. One does not have to go outside of the cities to find this proportion either.

If possession of radiographic equipment would result in its efficient use, it should be made compulsory, but this is no more true than the possession of the necessary instruments results in the efficient practice of prophylaxis. The manufacturers and dealers are spreading enough sales propaganda without this Society starting a campaign. We have a more useful field in improving the practice and developing the science of oral radiography. All dentists who cannot obtain competent radiographic service conveniently should install equipment and learn to properly use it. Other dentists will find it to their financial and professional advantage to refer the work to a specialist. This is not merely an opinion, but it is founded upon more convincing evidence than that quoted from Dr. Henderson. There is no doubt about a dentist's making an x-ray machine profitable if that is his sole motive. He could do the same with loaded dice. The question is, will it be profitable if his motive is the best service?

There are some questions which might be submitted to Dr. Henderson before accepting his calculations. Did he encounter any nervous, "gagging," or loquacious patients in his average record of 3½ minutes per radiogram? Was all of his time productive in other operations excepting the 3½ minutes? How does he obtain an average fee of $2.00 per film including those which are worthless (if the suggestion is pardonable), when the popular conception is that 50c each is the market price? Is his fee scale in a small town $25 per hour, and if not, why should his fees for x-ray examinations be larger than for other operations? When a dentist undertakes to calculate the cost of production he usually cheats himself, and gets a larger profit on paper than he can get in the bank. The suggestion that this

Society investigate the economics of radiodontic practice was for the benefit of those who are less successful than Dr. Henderson. He does not need *this* "treatment."

Dr. McAlpin disposes of the knowledge required for radiographic examinations by stating that the operation of the machine and finishing the radiograms is very simple and can be learned in a short time. Whether intentionally or not, by this statement he contributes to the impression that oral radiography is quite easy, an impression which has been the greatest factor in the neglect of this branch of practice. I cannot say how long a time is required to master radiodontia, because I still have so much to learn, but men who are giving it serious study are unanimous in believing it a difficult science worthy of intelligent application.

Dr. McAlpin's example of incorrect technic is confusing. He states that an exposure with an excessive penetration immediately after curettage "burned out" the detail, and appeared in the radiogram as though repair had occurred. This is the reverse of facts, for excessive penetration would exaggerate bone destruction and minimize repair. However, there is no occasion for caution in overpenetration with a $575 apparatus which he mentions.

PLACING AND HOLDING FILMS IN THE MOUTH

(PART I: GENERAL CONSIDERATIONS. PART II: TECHNIC BY REGIONS.)

BY HOWARD R. RAPER, D.D.S., INDIANAPOLIS AND ALBUQUERQUE

(*Continued from the July issue.*)

PART II. TECHNIC BY REGIONS

Maxillary Incisor Region

Fig. 28.—Maxillary incisor region. The film packet is bent for this region in much the same manner as for the mandibular incisor region; not so much of the film need be bent back and it need not be bent back so sharply as is usually necessary for the mandibular region.

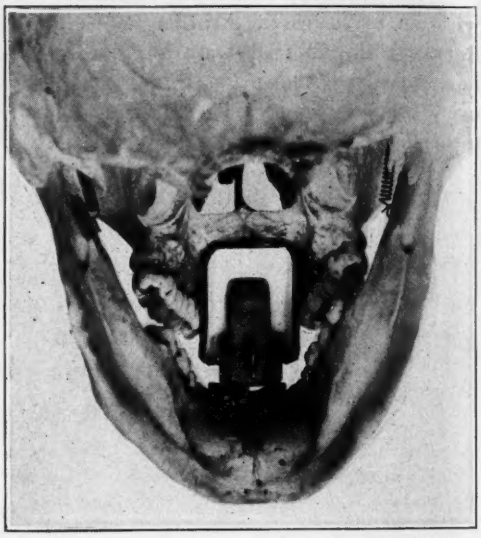


Fig. 29.—Maxillary incisor region. Lingual view of the film packet being held in place. (Holder No. 1 or No. 2 used for this region.)

Fig. 30.

Fig. 31.

Figs. 30 and 31.—Maxillary incisor region. When the film packet and filmholder are first put in place in the maxillary incisor region, the filmholder may stand so far forward that the mandibular teeth do not strike the bottom bite plane of the holder. This is illustrated in Fig. 30. To overcome this, do two things: Bend the lower part of the holder upward and backward (this is made possible by the flexibility of the rubber back support) and instruct the patient to "reach forward with the lower teeth and bite." The result will be that the mandibular teeth will then bite against the bottom of the holder and hold it (and the film packet) as illustrated in Fig. 31.

(Note that the forefinger of the right hand is held against the back of the film packet in the region of the rubber back support in Fig. 30. Also see Fig. 23.)

Maxillary Canine Region

Fig. 32.—Maxillary canine region. Bending the film packet for the maxillary right canine region. Quite a good deal of the upper front corner is bent back rather sharply.

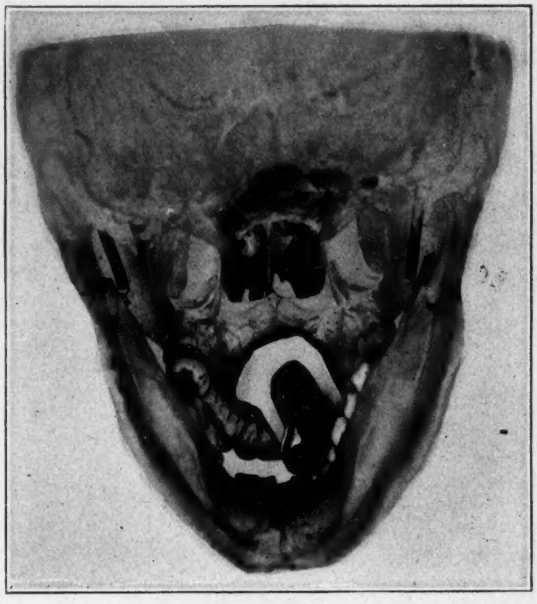


Fig. 33.—Maxillary canine region. Lingual view of the film packet held in position. The maxillary canine region is a rather difficult region. (Holder No. 1 or No. 2 used in this region.)

Fig. 34-A.

Fig. 34-B.

Fig. 35.

Figs. 34-A and 34-B.—Maxillary canine region. These two radiographs have the appearance of having been made with the films put in the mouth in different positions. The position of the films in the mouth was the same, however, for both. The reason the teeth fall diagonally on the film in Fig. 34-A is that the mesio-distal angle was too much like arrow No. 5A of Fig. 15. The mesio-distal angle for Fig. 34-B was more like arrow No. 5 of Fig. 15.

The shadows of the teeth almost never fall diagonally on the film when film holders are used except in the maxillary canine region, and, as just explained, it is due in this region to the mesio-distal angle, not to the manner in which the film is held in the mouth.

The shadows of the teeth often fall diagonally on the film when the film packets are held with the thumb or fingers unless the operator is very careful to line up the occlusal edge of his film packet parallel to the occlusal plane of the teeth.

Fig. 35.—Maxillary canine region. When the upper front corner of the film is bent too much, or when the mesio-distal angle is too much like arrow 5B of Fig. 15, the corner of the negative may finish entirely radiopaque as illustrated here. (This does not occur if the films are not backed with metal.)

Maxillary Premolar Region

Fig. 36.—Maxillary premolar (and molar) region. Considerable of the upper front corner is bent back rather abruptly and the upper back corner is bent slightly. The packet illustrated here is bent for the right side.

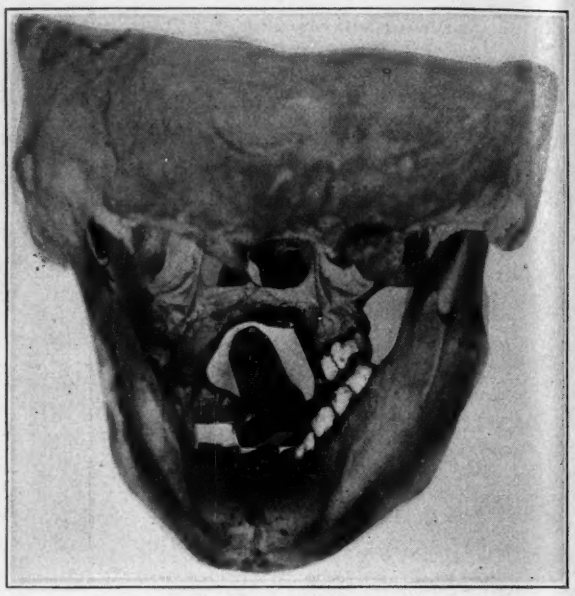


Fig. 37.—Maxillary premolar (and molar) region. Lingual view of the film packet held in place. (See also Figs. 8, 9, 11, and 12 of this region of the mouth.) (Holder No. 1 or No. 2 used for this region. The writer prefers holder No. 1.)

Maxillary Molar Region

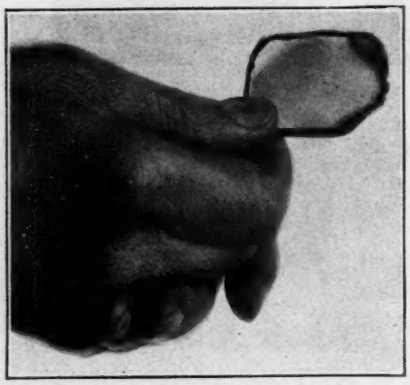


Fig. 38.—Maxillary molar region. Not much bending of the film packet is necessary for this region. Both front and back upper corners are bent slightly, also the lower back corner. The packet illustrated here is bent for the right side.

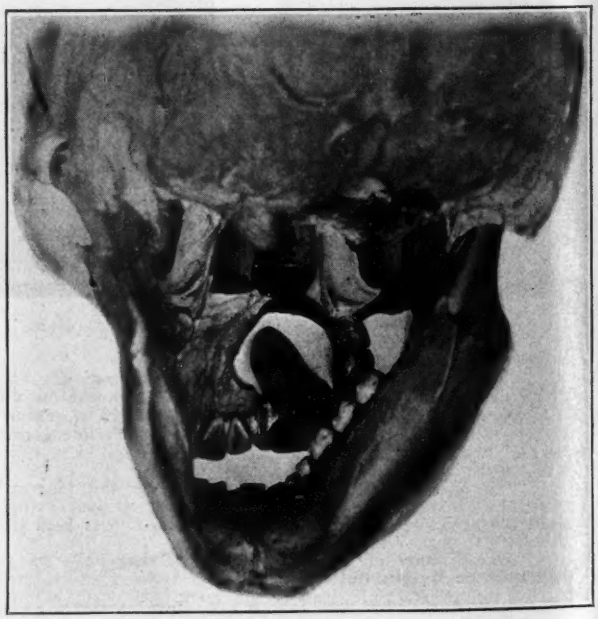
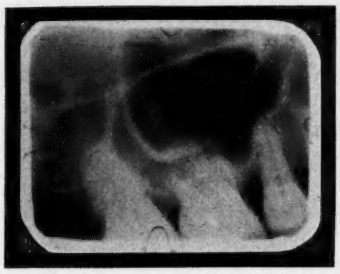
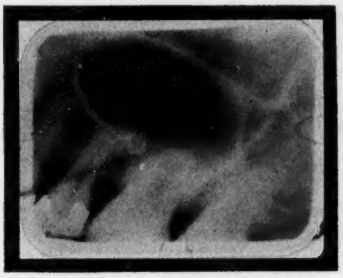


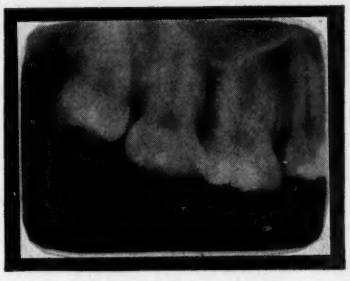
Fig. 39.—Maxillary molar region. Lingual view of the film packet held in place. The film packet can be held in this region with much greater ease and accuracy and less danger of gagging with the filmholder than with the patient's thumb or fingers. (Holder No. 1 for this region.)



A.



B.



C.

D.

Figs. 40-A, 40-B, 40-C, and 40-D.—Maxillary molar regions. The films for these radiographs were not held in the mouth correctly. They were held by the patient with the thumb. In Figs. 40-A and 40-B the lower edge of the film packet was not lined up parallel with the crowns. This does not occur when a filmholder is used if the operator makes it a point to see that the holder does not tip when the patient bites on it. If tipping occurs, adjust the holder farther anteriorly on the edge of the film packet. Where teeth are missing, the holder may tip into the space if the operator does not see to it that the holder is adjusted to the film packet in such location that this tipping does not occur. If the space from which the teeth are missing is wide enough holder No. 3 may be used.

In Fig. 40-C the film packet was not held far enough rootwise. This cannot occur when the filmholder is used.

In Fig. 40-D the film packet was held too far rootwise and so the radiograph does not show all of the crowns of the teeth. (It is desirable to see the crowns of the teeth, to see whether there is incipient proximal decay.) This sort of thing cannot occur when filmholders are used.

Fig. 41.—Same case as illustrated in Fig. 40-D. Fig. 41 was held correctly with a holder.

RADIODONTIC RIDDLES

Conducted by Clarence O. Simpson, M.D., D.D.S.

A Department Devoted to Discussion of the Scientific, Technical, and Ethical Problems of Radiodontia

RADIODONTIC RIDDLES

Illusion and Perspective

Q. Do the instruments advertised for viewing two films from the same exposure take the place of stereoscopic technic? If not, what is necessary to get the desired results?

A. Although magnifying lenses give a more distinct view of negatives than the unaided eye, the advantages of stereoscopic radiography cannot be obtained without two exposures made under the principles of binocular vision. Any viewing apparatus which eliminates extraneous light and distracting objects improves vision, while moderate magnification discloses additional detail and accentuates perspective. An ordinary reading glass noticeably separates the planes of distance and adds perspective to a photograph, and when applied to radiographic negatives serves the purpose without the complications of special viewing devices. Duplicate films viewed through a stereoscope give no more depth than the plastic or relief aspect secured by placing duplicate films in register and moving one slightly toward the lower right. In drawing and letter shading, this method is used to suggest the third dimension.

Stereoscopic photography and radiography is based upon an entirely different principle and serves a more useful purpose. Binocular vision is the fusion of the images seen with each eye by which form and distance are judged. The left eye sees slightly more of the left side of objects than the right eye, while the right eye sees more of the right side. The correlation of these impressions in the brain supplies the conception of the third dimension. The average distance of pupillary separation is 65 mm. or $2\frac{9}{16}$ inches, the extremes ranging from 60 to 70 mm. Hence, in accurately made stereoscopic cameras the lenses are placed 65 mm. from center to center, and in correct stereoradiography the tube target is shifted $2\frac{9}{16}$ inches between the two exposures. This produces two negatives, in which the relative position of objects in different planes is changed. To accurately record perspective, carefull technic is essential in exposures and mounting for view.

In stereoscopic intraoral radiography, immobility of the patient's head and the tube stand must be maintained from the beginning of the first ex-

posure until the end of the second. Contrary to the general belief, the films need not be placed in exactly the same location for the two exposures if they are in the same plane, a fact which Dr. C. Edmund Kells has demonstrated. Although an attempt should be made to place the films in the same location, considerable discrepancy can be compensated for in mounting. This adaptability may be carried to the extreme of often being able to improvise a stereoscopic view from two exposures made without thought of stereoscopic technic. These will rarely fuse perfectly in the stereoscope and are not reliable for evidence.

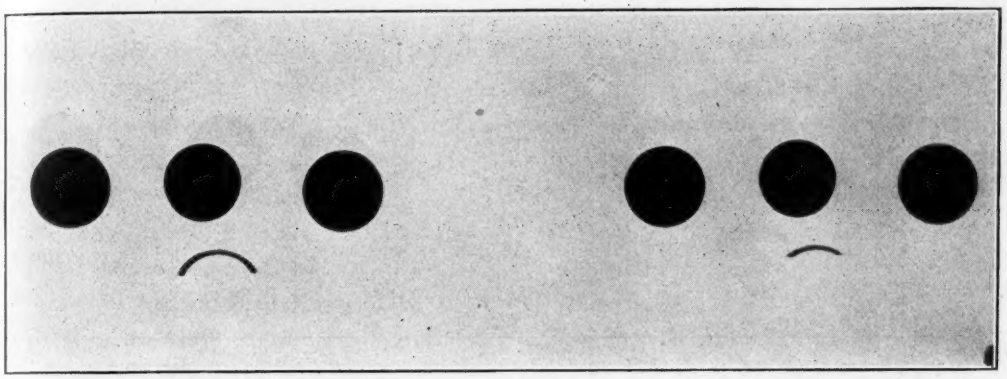


Fig. 1.—Duplicate films from the same exposure. You can view these spheres through a stereoscope until you see spots before the eyes as described in the nostrum almanacs, without being able to determine the relative size and location of the spheres. You would probably guess that the center sphere is farthest from the film.

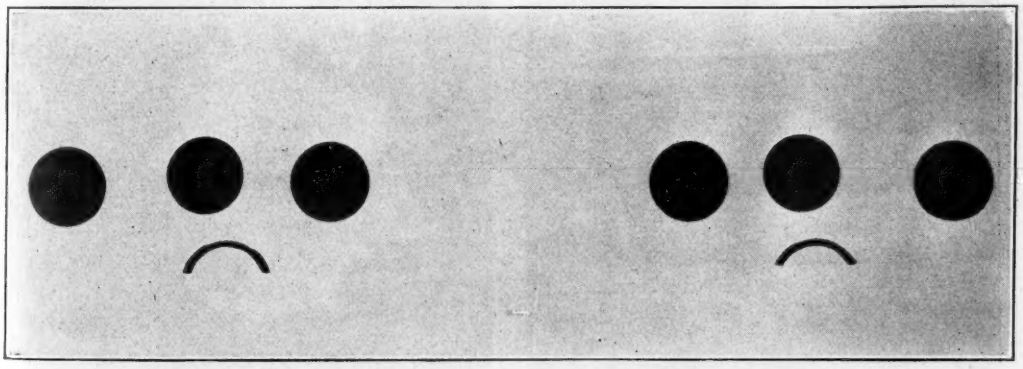


Fig. 2.—Three spheres of equal size arranged in an equilateral triangle, 1¼ inches from center to center. Radiographed at 18 inches with the target shifted approximately the correct distance. The result gives normal perspective with the relative size and location appearing in close conformity to existing conditions.

The stereoscopic shift when incorporated in tube stands is applicable only to a specific target-film distance if a small cone is used, because after the tube is shifted laterally the target is carried farther in each direction as the cone is centered. Such construction fulfills the requirements only when operating without a cone or an extremely large cone. Since the target should be moved no more or less than $2\frac{9}{16}$ inches, the lateral movement of the tube carriage must be restricted to a distance which produces the correct target shift after centering the cone. This distance varies in relation to the target-

film distance used, the lateral shift being shorter as the target-film distance is reduced. With a target-shift of more than the 2 9/16 inches the perspective is exaggerated and misleading in the relative size and location of objects. In conformity to this principle, the films should be viewed at the target-film distance. However, the eye is trained to judge the size of objects at different distances, so when there is an object of known size in the radiogram for comparison the viewing distance may be modified.

Unless the patient gives exceptional cooperation, it is advisable to bandage the head to the head rest. The chair and tube stand should be firmly

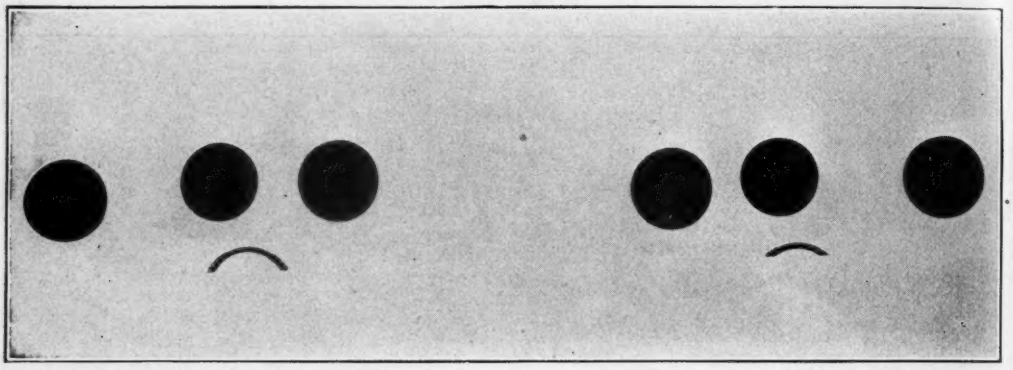


Fig. 3.—Exaggerated perspective from shifting the target too great a distance. Spheres in the same arrangement as Fig. 2. Radiographed at 12 inches with the target shifted 3¾ inches in centering the cone. The center sphere at the apex of the triangle appears about twice as far from the base as it is placed.

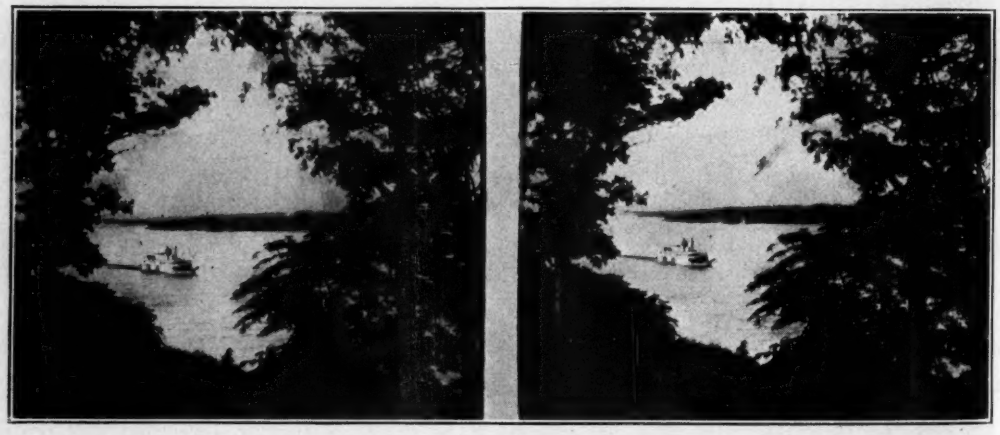


Fig. 4.—An accurately produced stereoscopic photograph giving the normal perspective in the slightest graduations of the distance planes. When stereoradiography is perfected to this state, the "pulpodontist" will be able to follow a canal like a corkscrew. Even stereoscopic photography is not just a matter of pushing the button. For example, if the camera is not laterally level, if the plate is not parallel with the plateholder, or accurately placed in the transposing frame, the result is worthless.

locked in position, and all preparations made to expedite the operation. With the tube carriage midway between the points established for the lateral shift the cone is centered upon the area to be examined. Before selecting the mesio-distal angle, the tube should be moved to the left and right position for trial. The curve of the arch often produces objectionable distortion when it is not equalized in the two oblique aspects, and unexpected wire complications may arise from the position of the tube stand. For methodical rou-

tine, either the left or right view should always be made first, so whatever disposition is made of the first film packet there is no confusion with the subsequent one. The films should be permanently marked before development which is easily done by performing a corner of the left view with one pin-hole and the right with two. This not only identifies each aspect, but distinguishes the stereoscopic films from others of the same case. After some experience the left and right films can easily be distinguished, likewise the tube or film view when mounted.

The film exposed with the tube shifted to the left of the operator while facing the patient must be mounted on the left side when viewed from the nonemulsion or lingual side, and changed to the right side when viewed from the emulsion or external side. In common with other intraoral radiograms, stereoscopic negatives should be viewed from the nonemulsion side since the underfiring and secondary radiation produce an exaggerated aerial perspective in addition to the linear perspective. However, when the relative density of structures is not under consideration, a clearer conception of conditions may in some cases be obtained by viewing from each side. This especially applies to the study of cysts and the maxillary sinuses. The films may be viewed by holding them with rested fingers before a Holmes stereoscope, or better holding them in position on a $2\frac{1}{2} \times 7$ inch piece of glass while an assistant attaches them with binding strips. If the images fuse in some portions and not in others, it indicates that an error, most probably movement of the patient, has occurred in the procedure.

This may seem a long tiresome answer to a simple question, but you must know all this and more before successfully doing stereoradiography. Quite different from just buying a fancy "scope" and having every "shot" a beautiful spun-glass stereoscopic view through the magic lenses. So it is with most accomplishments, the best typewriter will not spell for you, a Stradivarius will not make you a musician, or the mahogany nickle-plated x-ray machine make you a radiodontist. Remember that the enticing "slicker" who writes the advertisements for dental equipment is better paid than the dentist who is the ultimate consumer of superfluous equipment. Unless you care more for display than utility, a hand (Holmes) stereoscope sold by optical dealers for a dollar or two will supply your needs. Stereoscopic intraoral radiography has rather limited advantages, so do not expect too much from it.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Studies of Diet in Relation to Health. E. V. McCollom (Baltimore). The Journal of the National Dental Association, April, 1922, ix, 4.

This paper was read by a biochemist to a body of dentists. He refers to the time only a few years back when a chemical analysis of foods was believed to exhaust the nutritive possibilities. Then about 1914 came the doctrine of vitamines, and it was learned that mere laboratory analysis told us nothing; instead came feeding experiments on young animals. The protein, mineral ingredients, etc., still retain their importance up to a certain point. The new ingredients comprise three or four substances known as vitamines. If the fat-soluble one is left out of the diet completely, the eye is the organ which is most noticeably affected. If another is left out we see develop a group of diseases known in the tropics a beri-beri. This name, however, is misleading and instead we should use the general designation chronic polyneuritis. This is seen in Labrador, a cold country, and also has been seen in prisoners confined in Elizabeth, N. J. A third type of deficiency-disease is scurvy, including the infantile form.

A diet composed of the most wholesome and nutritious foods from the old viewpoint—whole grain breads and flours, fresh vegetables, the finest cuts of meat—may actually bring about death if vitamines are absent. Conversely a carnivorous diet with its complete want of balance will enable certain animals and birds of prey to subsist indefinitely on it if all three vitamines are present. This is equally true of a pasturage diet in the case of the herbivora—animals thrive the year around on alfalfa alone. A third diet is termed by the author the Oriental, which deserves close study to comprehend. Superficially the natives appear to live on whole grains, principally wheat and millet, with a certain amount of pork, poultry and eggs. Close scrutiny has shown that the natives of these lands, Northern China, Japan, really are leaf-eaters so called, who consume vast amounts of green vegetables, the other dietetic elements playing a secondary rôle. This Oriental diet of temperate regions is not to be confused with the regimen of Southern Asia. A fourth diet is the nomadic in which the natives live on sour milk and meat, so that it is in reality carnivorous, although some vegetables are eaten. It is

far superior to the Oriental diet in its effect on the general health. Once our ancestors were rice eaters because this was the only cereal which could compete with the grasses. With better facilities for cultivating the soil the other grains followed and many new kinds have continued to come into use. The process of high milling has been associated for one or another reason with physical deterioration. The teeth get less exercise and vitamines are sometimes eliminated from the diet. Both the teeth and bones suffer from deprivation of certain mineral matter. To comprehend this one should study the ancient and modern Icelander or American Indian. These peoples have come to subsist on package goods from the grocery instead of the products of the chase and hard foods. The changes may be summed up by the word rickets. The latter is not due to ordinary vitamine deficiency, or at least only to a limited extent, but is the result of change in diet, urban life, industrial life. Analogous conditions have been created for young animals in numerous experiments by many scientists including the author. To correct them it should only be necessary to return to the ancestral diet. Sugar should be cut out and greens and fodder types of foods substituted. What is aimed at is a return to a normal calcium and phosphorus ratio, for such is essential for proper growth of bone and teeth. Too little lime or too much phosphorus means rickets. There is also a vitamine involved but not the fat-soluble one. The efficacy of cod-liver oil and certain leaves of plants in rickets shows that some substance indispensable for fixing the mineral matter is present.

The Prophylactic Value of Using Nitrous-Oxide Oxygen in the Removal of Diseased Teeth to Avoid Systemic Reactions. B. H. Harms (Omaha). The Dental Cosmos, April, 1922, lxiv, 4.

The author's conclusions appended to his above articles are as follows: For the well-being of the patient anesthetics are not properly considered as to their physiological and pathological action. In the removal of diseased teeth it is desirable that none of the activity of the body defenses be limited or destroyed by the use of any drugs or anesthetics. The leucocytes are the body's first line of defense against invading microörganisms. Any agent which limits the action of the leucocytes, either by destroying them or preventing their passage to the invaded part by initial ischemia and secondary edema, tends to lower the resistance of that tissue and the individual to the invading microörganisms. Any tissue which has had its normal circulation and oxygen tension interfered with has lost its normal degree of immunity. Local anesthetics initially interfere with the circulation and oxygen tension of the parts that they anesthetize, and, secondarily, cause edema, thereby increasing the susceptibility of the part to infection and autoinoculation. General anesthetics, other than nitrous-oxid gas and oxygen, lower the resistance of the patient's mouth to infection. Fatal cases from the removal of teeth have not been properly reported.

Method of Determining the Prognosis of Oral Infections. H. J. Kauffer (New York). The Dental Cosmos, May, 1922, lxiv, 5.

In the past five years the author has recorded 200 cases of oral infection, analysis of which furnishes data of prognostic significance. This material was entirely selected, for all of the patients had originally sought the skin clinic and all were found later to have alveolar abscesses. The latter represented only mere coincidence for it is not suggested that the cutaneous lesions were results of oral infection. The author wishes only to show that these abscessed teeth were of the silent type—that the patients as a rule had no knowledge of their existence, and that this ignorance has its advantages in the analysis of a large material. Aside from the skin lesions the subject was mostly in excellent condition.

Of the 200 cases 162 had apical, and 130 lateral infection (pyorrhea). Thirty-eight had lateral abscess only against 70 with only apical abscess. Every one of the 200 patients was treated with autogenous vaccine, the organisms being taken directly from the oral abscess. In 28 of the number there was a marked reaction from a small dose and in each case there was evidence of focal infection—muscular rheumatism, neuritis, arthritis, etc. With a few exceptions all of these cases recovered completely after extraction and vaccinotherapy. Of the other 172 cases 48 received root-canal therapy by various methods. In the entire series of 172 even large doses of autovaccines had failed to produce a reaction. Thirty cases of pyorrhea were cured by routine treatment. This leaves 94 patients who were permitted to retain the teeth save the one used to prepare the pus for vaccination. Pyorrhea, when present, was treated, but periapical abscess was let severely alone and up to date there have been no focal lesions or symptoms.

The International Journal of Orthodontia, Oral Surgery and Radiography

PUBLISHED THE FIFTEENTH OF EVERY MONTH BY

THE C. V. MOSBY CO., 801-809 Metropolitan Bldg., St. Louis, Mo.

Foreign Depots—*Great Britain*—Henry Kimpton, 263 High Holborn, London, W. C.; *Australasia*—Stirling & Co., 317 Collins Street, Modern Chambers, Melbourne; *India*—"Practical Medicine," Egerton Street, Delhi; *Porto Rico*—Pedro C. Timothee, Rafael Cordero 68, San Juan, P. R.

Subscription Rates.—Single copies, 75 cents. To anywhere in United States, Cuba, Porto Rico, Canal Zone, Mexico, Hawaii and Philippine Islands, $6.00 per year in advance. Under foreign postage, $6.40. Volume begins with January and ends with December of each year.

Remittances—Remittances for subscriptions should be made by check, draft, postoffice or express money order, or registered letter payable to the publishers, The C. V. Mosby Company.

Contributions—The editor will be pleased to consider the publication of original communications of merit on orthodontic and allied subjects, which must be contributed solely to this journal.

Opinions—Neither the editor nor the publisher hold themselves responsible for the opinions of contributors, nor are they responsible for other than editorial statements.

Reprints—Since it is not desirable to hold type standing longer than absolutely necessary, all requests for reprints should be made at time of submitting manuscript for publication. Rate card will be sent with galley proof.

Communications—Contributed articles, illustrations, letters, books for review, and all other matter pertaining to the editorial department should be addressed to the Editor, Doctor Martin Dewey, 501 Fifth Ave., New York City. All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 801-809 Metropolitan Building, St. Louis, Mo.

Illustrations—Such halftones and zinc etchings as in the judgment of the editor are necessary to illustrate articles will be furnished when photographs or drawings are supplied by the authors of said articles.

Advertisements—Objectionable advertisements will not be accepted for publication in this journal. Forms close first of month preceding date of issue. Advertising rates and sizes on application.

Change of Address—The publishers should be advised of change of subscriber's address about fifteen days before date of issue with both new and old addresses given.

Nonreceipt of Copies—Complaints for nonreceipt of copies or requests for extra numbers must be received on or before the fifteenth of the month of publication; otherwise the supply is apt to be exhausted.

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter.

EDITORIALS

Mayo Asks Bigger Schools

A NEWS article in the Minneapolis Journal of June 12 containing the above heading, gives some of the views Dr. William J. Mayo holds in regard to medical education, as it is being conducted at the University of Minnesota.

We have known for a number of years that certain university medical schools, as well as dental schools, have been working towards the goal of exclusive education in the professions and have been raising their preliminary requirements so high that only a few students were able to enter. In addition to that, some schools of medicine have been limiting their classes and are not accepting as many as can meet the preliminary requirements. This has been very unfortunate; as a result of it, a large number of students, who would otherwise study medicine have been forced into the osteopathic, chiropractic and neuropractic schools.

The action of such medical schools has produced a condition to which we have called attention before. It is a great detriment to the medical profession as well as the public at large. For a number of years, the medical profession has been able to enact certain laws regulating the practice of medicine and controlling public health, but in the next few years to come, we will find that medical laws and health programs will be controlled not by graduates from medical schools, but by men from osteopathic, chiropractic and neuropractic schools, because they will gradually outnumber the medical men and will consequently be able to control all legislation.

In California, the chiropractors have organized, and are now of sufficient numbers to practically control the situation at the present time. This is one phase of the subject which is to be regretted, but is different from the one suggested by Dr. Mayo in his interview published in the Minneapolis Journal. Dr. Mayo says "The University should provide that any one who wants to enter a university may do so if he is capable of meeting their requirements. The university has no right to add subjects to its curriculum that are not useful today. We are giving the student an enormous amount of information that is of no use."

We believe Dr. Mayo refers to subjects given in the pre-medical course which consume time and which may be interesting as cultural branches but which do not increase the student's ability to practice medicine as a healing art.

Dr. Mayo, as well as President L. D. Coffman, calls attention to the fact that last year there were 224 applicants to the school of medicine, 200 of which met the requirements for admission and only 40 were admitted, while 160 were turned away. It would be quite an interesting thing to know where the 160 men went who were turned away. Probably you will find most of them in chiropractic, osteopathic and neuropractic schools and you may be assured that as a result of the treatment which they received from the medical school, they will hold no good will toward the medical profession after they graduate.

Certainly the 160 turned away will be a larger factor in the future of medicine than the 40 who were graduated. Let us hope that the authorities that are controlling medical education at the present time will realize that their greatest duty is to provide medical service for the public by an efficient educational plan, which will allow a sufficient number of men to enter medical college to take care of the medical needs of the public. There is no reason why 40 students should be educated and 160 turned away just because a certain medical program has been outlined by a few individuals which makes such a plan compulsory.

We believe that a similar plan is being advocated by a certain group in regard to dental education, and the information has come to us from various sources that in the future, certain dental schools will limit their classes to small numbers and try to force the requirements of the dental profession to meet the requirements of the schools who advocate small classes, but necessarily must possess large endowments.

We only hope that the impracticability of this plan of dental and medical education will become apparent before too much harm has been done to the profession.

Genetics*

THE first edition "Genetics" by Herbert Eugene Walter, made its appearance nearly ten years ago. A quotation from the Preface of this second edition is a very accurate account of the progress which has been made in the last ten years. Quoting from the preface we find "The biological Rip Van Winkle of today who awaking after a decade of somnolence, gazes again upon the genetic village of Falling Waters, will indeed need to rub his astonished eyes at the changed scene that now spreads out before him. Many old familiar landmarks, such as 'unit characters' and 'dominance,' show signs of dilapidation, while strange children, shouting a medley of outlandish words, 'linkage,' 'tetraploidy,' and 'nondisjunction,' for example, are playing new games on the village green."

The statement of the author shows that our ideas in regard to hereditary characteristics have been radically changed during the last ten years due to research work by many investigators. He quotes extensively from the work of Castle, Morgan, Conklin and Babcock and Clausen, and we know of no volume that will give a better analysis of the subject today.

The question of heredity has always been of importance to the orthodontist, and so many men know so little about the subject that we find statements made by various writers exactly opposite to those of others. In fact, some men will interpret a certain portion of research work as meaning one thing while a more capable man will get an entirely different view.

The book begins with a chapter dealing with the "Idea of Species" and the "Relation of the Somatoplasm to the Germplasm." The subject of "Variation" is very carefully considered. The different views of the old writers are given attention.

The chapter on the "Inheritance of Acquired Characters" is extremely interesting to the orthodontist because it is around this field that so much orthodontic literature has been written. Likewise, blending inheritance is very important, because of the bearing it has on the old theory that a child will inherit the teeth of the one arch and the small jaws of the other.

One very interesting chapter is the determination of sex, which is a subject that has received much attention during the last few years. The last two chapters are devoted to the human race in which a study of the lower animals is considered in the application of the human.

The orthodontist is interested in Genetics and the result of heredity as a production of malocclusion. We know of no book from which he can gain a greater amount of knowledge.

---

*Genetics. By Herbert Eugene Walter, Associate Professor of Biology, Brown University. Revised edition 92 figures and diagrams. Published by the MacMillan Company.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the Journal, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Side Lights of the California Meeting of the National Dental Association

OTHER meetings in the past have had to contend with hot weather, sometimes with beastly hot weather—so hot in fact that one felt like sending for the traditional blankets, which ex-president Taft once said were a necessary appendage to one's equipment when changing place of residence from the Mojave desert of California to hades.

No so with Los Angeles. As usual the weather and climate were delightful, all that could be expected with a little thrown in for good measure.

It has been said that next to taxes and the high cost of living, California climate is about the most dependable institution we have in this country—yes and one of the most satisfactory. It is not beautiful in spots, it is beautiful all over.

But to get more specifically to orthodontia and the orthodontic section of the big meeting, first the California orthodontists (of which there seems to be plenty to amply serve the population) did themselves proud in making the stay of visiting orthodontists pleasant and agreeable. The spirit seemed to prevail everywhere, with very few exceptions in effect that whether you are a user and loyal advocate of Dr. Jones' barbed wire trench entanglement appliance or whether you are equally enthusiastic over the merits of Dr. Smith's or Doe's "work while you sleep" wonder-worker, that you were there for one grand purpose, namely to exchange and mutually discuss ideas for the advancement of orthodontia as a science and specialty.

The casual tourist learns to lend an attentive ear to the wonderful stories of development and growth of southern California and the almost astounding incidents which happen in this God-favored spot. In fact there was one story current in the orthodontic section at least in which it was said that while the favored city could not boast of a scenic wonder so outstanding as the belching volcano Mount Popocatepetl in Mexico, it could boast, however, of a fire department which can put the famous volcano *out* if their services should be required at any time.

There were stories current of equal interest and astonishment to visit-

ing orthodontists, incidents having occurred of orthodontic cases having been treated in three or four visits to the orthodontist in some instances, the patients being from several hundred miles distant from the city.

Really the majority of things said about the wonderful spots of southern California are true and the citizens of this community are anxious to show you that they are true. The native dentists at the meeting would tell you a story, then ask you to get into their automobile and usually the story would be proved or it would turn out to be a joke upon you the unfortunate and unhappy visitor in the community.

To the tired orthodontist who has made the long jaunt to California in search of both youth and knowledge there are only two things which remain a mystery in his mind. First those little animals, which they tell you about which make their residence in the bottom of the Grand Canyon and when you are bitten by them will not release their hold until it thunders; and second, the superorthodontic device will remain one of California's newest and most interesting mysteries heard of in the miracle city.

The visiting dentists were invited to see Tom Mix, the famous film star, do some astounding feats of horsemanship in the Hollywood bowl.

The following is a résumé of the program of the section of orthodontia and periodontia.

Tuesday Afternoon, July 18

2:00 to 4:00.

ORTHODONTIA AND PERIODONTIA

(*Assembly Room "H," Ambassador Hotel*)

OFFICERS OF SECTION

Leland E. Carter, Chairman ..... San Francisco, Cal.
Flood Bldg.
Clyde M. Gearhart, Vice-Chairman ..... Washington, D. C.
1624 I St., N. W.
B. Frank Gray, Secretary ..... San Francisco, Cal.
909 Hyde St.

"Some Things of Importance to Be Considered in the Practice of Periodontia and Orthodontia"
By Frank M. Casto ..... Cleveland, Ohio
Discussed by
J. Herbert Hood ..... Cleveland, Ohio
O. W. White ..... Detroit, Mich.

"Inharmonious Cusp Relation as a Factor in Periclasia"
By A. W. Ward ..... San Francisco, Cal.
Discussed by
Frederick S. McKay ..... New York, N. Y.
J. H. Mackay ..... Oakland, Cal.

"Surgical Treatment of Periodontal Lesions"
By Olin Kirkland ..... Montgomery, Ala.
Discussed by
Frank C. Pague ..... San Francisco, Cal.
D. Arthur Johnston ..... Los Angeles, Cal.

Election of section officers for ensuing year.

Wednesday Morning, July 19

9:00 to 12:00.

ORTHODONTIA AND PERIODONTIA

(*Assembly Room "H"*)

"The Importance of Simplicity in Orthodontic Mechanism"
By James D. McCoy ..... Los Angeles, Cal.
Discussed by
Charles C. Mann ..... Seattle, Wash.
J. Camp Dean ..... Oakland, Cal.

"The Third Molar vs. Normal Occlusion"
By H. L. Morehouse ..... Spokane, Wash.
Discussed by
J. A. Gorman ..... New Orleans, La.
Allen H. Suggett ..... San Francisco, Cal.

"The Regulation of Children's Teeth"
By Calvin S. Case ..... Chicago, Ill.
Discussed by
B. E. Lischer ..... St. Louis, Mo.
M. N. Federspiel ..... Milwaukee, Wis.

Thursday Morning, July 20

9:00 to 12:00.

ORTHODONTIA AND PERIODONTIA

(*Assembly Room "H"*)

"The Orthodontist's Problems in Connection with Pulpless, Missing and Impacted Teeth"
By Albert H. Ketcham ..... Denver, Colo.
Discussed by
Robert Dunn ..... San Francisco, Cal.
Frank A. Gough ..... New York, N. Y.

"Arch Predetermination—Is It Practical?"
By William H. Gilpatric ..... Boston, Mass.
Discussed by
John R. McCoy ..... Los Angeles, Cal.
Carl O. Engstrom ..... Sacramento, Cal.

Clinics

ORTHODONTIA

COLORADO

29

"An Orthodontic Method of Supplying a Missing Tooth"
By A. H. Ketcham ..... Denver

MASSACHUSETTS

30

"Demonstrating Arch Predetermination" (Table Clinic)
By William H. Gilpatric ..... Boston

MISSOURI

31

"Demonstrating the Various Points of Merit of an Original Orthodontic Appliance" (Table Clinic) (1) Very active through an extended period. (2) Inconspicuous and nonirritating. (3) Favorable to prophylaxis. (4) Easily constructed. (5) Easily controlled. (6) Easily converted into retaining appliance. (7) Constructed of noble metals at a cost ranging from one-third to one-half less than manufactured appliances.

By Hugh G. Tanzey ..... Kansas City
Homer Anson Potter, Jr. ..... Kansas City

MONTANA

32

"Orthodontia Showing an Original Method of Attachment"

By H. K. Vonder Heydt ..... Butte

NEW YORK

33

"Orthodontia"

By A. Hoffman ..... Buffalo

OREGON

34

"Orthodontia—Consideration of Principles Involved in the Treatment of Cases Requiring Pronounced Development"

By E. M. Griffith ..... Portland

Pacific Coast Society of Orthodontists

The Ninth Annual Meeting Pacific Coast Society of Orthodontists was held at the Angelus Hotel, Los Angeles, California, Thursday, Friday and Saturday, July 13, 14 and 15, 1922.

The following program was enjoyed:

Thursday, July 13

10:00 A. M.
President's Address.
Dr. Charles C. Mann, Seattle, Wash.
Discussion opened by Dr. James D. McCoy, Los Angeles, Cal.
Business meetings of the Society will be announced by the President.

2:00 P. M.
"Art in Dentistry"
Dr. Allen H. Suggett, San Francisco, Cal.
Discussion opened by Dr. B. Frank Gray, San Francisco, Cal.

3:00 P. M.
"Malocclusion—A Million Cases! How Prevented"
Dr. B. Frank Gray, San Francisco, Cal.
Discussion opened by Dr. John R. McCoy, Los Angeles, Cal.

Friday, July 14

9:30 A. M.
"Usefulness of the X-ray Machine in Orthodontia"
Dr. Charles S. McCowen, Palo Alto, Cal.
Discussion opened by Dr. Leland E. Carter, San Francisco, Cal.

10:30 A. M.
"The Influence of the Endocrine Glands Upon Dentition." (Lantern slide demonstration of Endocrinopathies.)
Dr. Nelson W. Janney, Los Angeles, Cal.
Discussion opened by Dr. James D. McCoy, Los Angeles, Calif.

2:00 P. M.
"Some Anomalies of Dentition of Interest to the Orthodontist." (Illustrated Lecture.)
Dr. J. Lowe Young, New York.
Discussion opened by Dr. H. L. Morehouse, Spokane, Wash.

3:00 P. M.
"Principles of Dento-facial Diagnosis of Malocclusion." (With lantern slides.)
Dr. Calvin S. Case, Chicago, Ill.
Discussion opened by Dr. Robert Dunn, San Francisco, Cal.

Saturday, July 15

9:30 A. M.
"The Lingual Wire in Early Orthodontic Treatment"
Dr. E. C. Read, Long Beach, Cal.

Discussion opened by Dr. Allen E. Scott, San Francisco, Cal.

10:30 A. M.

"Advantages of Lingual Appliances, When Indicated, and the Ideal Age for Their Application in Distoclusion Cases"
Dr. P. T. Meaney, Portland, Ore.
Discussion opened by Dr. H. F. Sturdevant, Portland, Ore.

11:30 A. M.

"An Advantageous Method of Applying Lingual Orthodontic Appliances"
Dr. W. J. Bell, Los Angeles, Calif.
Discussion opened by Dr. A. A. Solley, San Francisco, Cal.

CLINICS

2:00 P. M.

"Arch Predetermination"
Dr. W. H. Gilpatric, Boston, Mass.

"Meeting the Problems Occasioned by Missing and Pulpless Teeth"
Dr. A. H. Ketcham, Denver, Colo.

"Construction of Appliances for Bodily Movement of Teeth"
Dr. Calvin S. Case, Chicago, Ill.

"Attachments to the Labial Arch Wire"
Dr. Arthur W. Sobey, San Francisco, Cal.

"The Lingual Inclined Plane"
Dr. Howard Dunn, San Francisco, Cal.

"The Removable Lingual Arch in Combination with a Labial Arch Wire for the Treatment of Certain Types of Malocclusion"
Dr. James D. McCoy, Los Angeles, Cal.

"Instruments for Unlocking, Removing and Replacing the Lingual Arch Wire"
Dr. John R. McCoy, Los Angeles, Cal.

"Bite Impressions"
Dr. Carl O. Engstrom, Sacramento, Cal.

"Black Club Exhibit"
Dr. Thomas R. Sweet, Oakland, Cal.

"The Use of Special Instruments for Determining the Accuracy of Adjustments to the Lingual Arch"
Dr. Robert Dunn, San Francisco, Cal.

Notes of Interest

After August first Dr. L. J. Porter will be located at 665 Fifth Avenue. New York City.

Dr. P. T. Meaney, orthodontist, announces the removal of his offices from the Stevens Building to 902 Selling Building, Portland, Oregon

Dr. John Milton Jones announces his removal to seventh floor Orpheum Building, Wichita, Kansas. Orthodontia exclusively.

Dr. George E. Halley announces the removal of his offices to 607 Bryant Building, Kansas City, Mo., where he will continue to practice orthodontia exclusively.

Dr. Frederick K. Ream and Dr. John W. Berryman announce their removal from Aeolian Hall, 33 West 42nd Street, to 452 Fifth Avenue, at 40th Street, New York City. Oral surgery and dental radiography.

Wilson Robert Conran, D.D.S., two years dental interne Hartford Hospital, announces the opening of his office at Number Eighteen Asylum Street, Hartford-Aetna National Bank Building, Hartford, Conn. Practice limited to oral surgery and radiography.